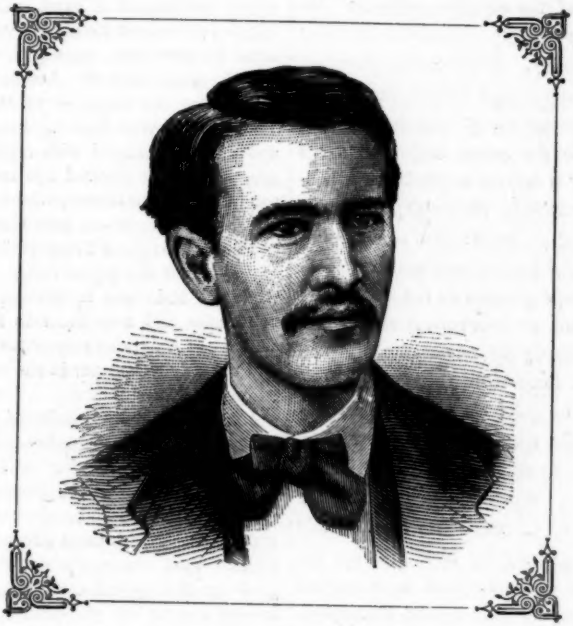
THE PHRENOLOGICAL JOURNAL AND LIFE ILLUSTRATED.

VOL. 66. 1878.

NUMBER 2.] *February, 1878.* [WHOLE NO. 470.



THOMAS A. EDISON,

THE ELECTRICIAN AND INVENTOR.

THIS portrait indicates an organization of remarkable activity. The mental element predominates greatly in the physical constitution, and so contributes to his energy of thought and facility of action. His brain is broad between the ears, indicating that he possesses force of character in a high degree, which is exhibited in his disposition to be doing, to find opportunities for the employment of his hands or mind or both. He has courage to work out his plans and purposes when obstacles present themselves. Earnestness characterizes his efforts in any chosen direction; and this, coupled with his mental intensity, renders him very thorough-going. Whatever engages his attention, so far as to make him a worker either as principal or assistant in its

promotion, receives no half-way attention. He throws himself vigorously into its methods. Back of his efforts lies ambition, which is indicated by the width and fullness of the upper back part of the side-head and crown. He has ever entertained high aspirations; to achieve whatever he may attempts has been an uppermost quality in his mental character.

His intellect is characterized by a large proportion of the reflective element. He has also very strongly-marked Constructiveness and Ideality. These two faculties are closely associated, and have impressed his whole intellectual career. The brain is well developed in the moral region, giving a strong sense of duty, an appreciation of honor and respectability. He is also sympathetic and confiding, yet possessed of so much impressibility and sensitiveness as to show irritability; and people who do not understand him may think he is impatient and fretful. His extraordinary mental activity works off his physical force with great rapidity; so that, unless he order his habits in accordance with the requirements of physiology and hygiene, he will become exhausted and break down. We would suggest, for the sake of the career which has been already opened so grandly by him, and for the achievement of further and even greater successes, that he take special precautions for the invigoration and safety of his health.

Thomas Alva Edison, the subject of this sketch, was born in Milan, Erie County, Ohio, on the 11th of February, 1847, and is, therefore, scarcely thirty-one years of age. His father's people came from Holland, and settled near Newark, N. J. His father's mother was an Ogden, from a branch of the New York family of that name. The Ogdens were of English descent. When Edison was about eight years of age, his parents removed to Port Huron, Michigan, from which time he appears to have begun to earn his own living. He was then a newsboy; and, at the age of twelve, obtained an exclusive contract for the sale of newspapers on the Detroit division of the Grand Trunk Railway. Here his energy and determination to excel began to exhibit itself. He employed several boys to aid him, and continued to travel and sell newspapers until seventeen years of age. Meanwhile, he purchased a small printing outfit, which he carried on the train, and with which he printed a small weekly paper, called *The Grand Trunk Herald*. In this office he was editor, manager, typo, devil, and all, within himself. Articles were contributed by the employés of the railroad. The printing was done by hand-pressure, and the paper issued with regularity. Its subscription list showed 450 names. The son of Robert Stevenson, who accompanied a Board of Inspectors sent from England to inspect the Grand Trunk Railway, seeing an edition of the paper being worked off while the train was in motion, purchased 200 copies and sent them to England as samples of American newspaper enterprise, and the only newspaper in the world printed on a railway train.

Mr. Edison finally abandoned the printing business, and set up instead a traveling chemical laboratory, consisting of innumerable bottles and packages of chemicals and drugs, which he carried in a large chest on the train, experimenting with them during his leisure hours. This enterprise came to sudden grief by the spontaneous combustion of several ounces of phosphorous, and the consequent firing of the baggage-car in which they were carried. Upon the breaking out of the war in the South, the enormous increase in newspaper traffic confined his attention solely to that branch of industry, and offered opportunities for the exercise of his original genius to meet the eager demand for news—a demand which Mr. Edison noticed could ill brook the tedious movement of the trains. He conceived the idea, and had constructed large bulletin-boards, one of which he placed at each station along the line. Upon these boards he caused to be chalked, by telegraph oper-

ators and station agents, the news headings of his papers, which he telegraphed in advance of the train. This device was noticed and characterized by the press as a "thoughtful idea of a newsboy," and was speedily adopted on other roads. The relations young Edison thus formed with the telegraph awakened a desire to understand it, which he gratified by very soon learning to operate it. Not content with the ordinary opportunities offered by the railway telegraph stations, he, in conjunction with a neighbor having similar inclinations, built a line of their own, one mile long, through a wood dividing their houses. Edison constructed the instruments, but having no battery, and, doubtless, no money to purchase one, was at a loss to know what to do. A novel expedient soon occurred to him, but its application resulted in total failure. Having noticed that by rubbing a cat's back electric sparks were generated in the fur, he tried the experiment of fastening the wire to the cat's legs, and rubbing Tabby briskly, watched for an effect upon the instrument, but none followed. His failure he doubtless attributed, at that time, to the crudely constructed instruments. It is proper to call particular attention to this incident here as it is perfectly characteristic of the man. He will to-day undertake elaborate experiments and conduct them with great care and marvelous patience and perseverance, although his reason clearly points their utter futility. It is this trait, however, which has led him into lines of original discovery and observation unattempted by others.

Edison now became absorbed with the telegraph, and speedily very proficient as an operator. He took charge of the telegraph office at Port Huron, but soon quitting the railway telegraph service for the higher branch of commercial telegraphy, we find him occupying positions successively at Indianapolis, Cincinnati, Louisville, Memphis, and Boston. While at Cincinnati, in 1867, he conceived the idea of transmitting two messages over one wire at the same time; this had been attempted by electricians many years before, but of this fact Edison was totally ignorant, and he continued to make experiments in every branch of telegraphy, attending to his office duties at night, and experimenting in the day-time. It was this compulsory division of labor which founded the habit now too strong to be shaken off even by the combined pressure of family and health considerations, and which is commented upon as an eccentricity by those who do not appreciate the power of a long-established habit in the division of one's mental labor. It is unquestionably a fact that Mr. Edison finds his brain more active in the small hours of the night than at any other time; and the writer of this sketch has personal knowledge of the fact that nearly all of his most valuable and brilliant conceptions have been made just before the break of day, when a general discussion of their merits would be had with his assistants, and drawings made for his workmen to use the next day.

In his early days, as well as in later, Mr. Edison's entire earnings were spent in these experiments, he having few personal wants, and no vicious extravagances of any kind. In Louisville, Cincinnati, and Boston he always had a laboratory of more or less magnitude. In 1869 he left the operator's chair entirely, and came from Boston to New York with a duplex and a printing telegraph, the latter being the basis of nearly all the Gold and Stock Exchange reporting telegraph instruments. In New York he soon formed an alliance with electricians and manufacturers, and after years of varied experience with partners in the laboratory and in the shop, has finally and firmly established himself upon an independent footing in an extensive way at Menlo Park, New Jersey, where he is surrounded with everything which can contribute to domestic comfort or facilitate future invention and research. His property consists of a well-constructed and furnished laboratory with chemicals, telegraph instruments of every description, etc., etc., in its comprehensiveness being second to no other establishment of the kind in the United States, having a factory with steam power for the construction of models; a foundry for casting iron and brass; a handsome villa, with stables and outbuildings, and comfortable

cottages for his assistants and workmen. Among Mr. Edison's contributions to the telegraphic art, we find sixty patents and caveats assigned to the Gold and Stock Telegraph Company of New York, fifty to the Automatic Telegraph Company, and some thirty patents and numerous caveats for miscellaneous inventions; in all, a total of one hundred and thirty-nine patents and sixty-seven caveats, and all taken out since 1870. He is joint inventor with E. A. Callahan, of the American District Telegraph instruments (the modern messenger service); inventor of the Domestic Telegraph system (another messenger service); inventor of the main features in the Gold and Stock reporting telegraph; inventor of the American automatic (chemical recording) system; inventor of a chemical recording automatic Roman letter printing telegraph; inventor of the celebrated quadruplex system now so extensively used by the Western Union Company; inventor of numerous forms of duplex telegraphy, and inventor of the Electric pen, which is fast becoming popular as a substitute for circular printing.

Of this invention, an account has already been given in this journal. It consists of an electrical engine fixed to a needle working vertically in a hollow tube, the whole being held in the hand as a pen, and operating to puncture fine holes in a sheet of paper upon which one writes, thus producing a perfect stencil of the written matter. By placing this stencil upon a blank sheet and passing an ink roller over its surface, a perfect fac-simile in ink of the perforations may be had. Other inventions of more or less value, which it would occupy volumes to describe, are the product of Mr. Edison's genius.

The electro-motograph, for which he received the eighth patent issued by the United States for original discovery, would, of itself, give us a perfect system of telegraphy, were magnetism never discovered. It in fact offers the only other means of contributing motion (and controlling it) to mechanism at a distant point—the foundation principle of the electric telegraph.

The discovery which led to the construction of this instrument is this: That when certain chemical salts are subjected to the action of an electric current they lose all their frictional properties. Thus, if a strip of paper is moistened in a solution of say chloride of potassium, and laid upon a plate having connection with one pole of a battery, and a flat platinum strip having connection with the other pole of the battery is held by the hand and drawn heavily over the surface of the moistened paper, there will be found little or no friction between the platinum strip and the paper, it gliding over the surface like iron on ice. But, if now the electric current is interrupted, the hand will be involuntarily stopped, because the current no longer passing through the paper the normal friction of the paper is instantly applied. Upon closing the battery current while the hand is slowly drawing the platinum strip over the paper against the friction, the hand will be instantly released, and involuntarily glide forward. With this difference of friction obtainable by the action of electricity, Mr. Edison saw at once that he could produce precisely the same mechanical results as by the electro-magnet. The mechanism of this substitute for magnetism may be varied in a hundred ways; the simplest form, however, may be thus briefly described: A clock work is made to revolve a flanged metal drum. This drum carries over its surface a continuous strip of the chemically saturated paper, not too moist. Pivoted at right angles with the drum is a lever of brass with the free end projecting slightly beyond the center of the drum; through this end an adjustable screw with platinum or lead point is made to rest upon the paper strip, thereby supplying a frictional surface. To increase this friction to any desired extent consistent with the tenacity of the paper an adjustable spiral spring is placed under the lever to draw it downward upon the drum (the pivot of the arm being double-acting, permits this motion also). Two adjustable stops confine the movement of the lever within any desired limits. It will be seen that the revolving of the drum will carry the lever against the forward point by means of the great friction imposed by the pressure of the lever point upon the paper.

A second adjustable spring is now made fast to the lever to pull it backward against the friction, but being adjusted so as not quite to overcome it, the lever remains against the forward point. The circuit is now made through the paper from the lever to the drum, and instantly the friction is destroyed and the lever drawn back by the spring against the back stop, remaining there until the current is withdrawn, when the constant forward motion of the drum as instantaneously grapples the point and carries it forward. Here, then, we have all the functions of an electro-magnet for telegraphic purposes.

This is regarded as Mr. Edison's greatest achievement, and one destined, some day, to prove of immense value. Its extraordinary delicacy may be appreciated when it is stated that in the course of one experiment it was made to give telegraphic signals through 70,000 *ohms* resistance by means of a battery current that through that resistance would not record a trace of itself upon paper steeped in a saturated solution of iodide of potassium.

The electro-motograph telephone is an invention based upon the above described principle of action, and is now demonstrating the marvelous range of action of this wonderful discovery, by transmitting the full compass of vocal and instrumental vibrations over an ordinary telegraph wire 200 miles in length, reproducing the tones with great accuracy. The vocal vibrations are converted into electrical impulses, thus:

A brass tube six inches long, two and a half inches in diameter, having a mouth-piece at one end, and a thin metallic or mica diaphragm stretched across the other end; in the center of this diaphragm is fixed a delicate elliptic spring having a platinum face. Through this spring is passed a cushion of felt, the object of the hole being to prevent rebound. Immediately in front of this is placed an adjustable screw with platinum contact point. The diaphragm being connected with the line and the adjustable point with the battery, when the air-waves are thrown into the tube from the voice or a wind instrument, the diaphragm responds in unison, and at every outward movement comes in contact with the battery point, thus completing the circuit, and of course breaking it again upon its receding from it, the whole constituting a key responsive to the vibrations of the voice instead of the touch. The electrical impulses thus passed over the wire to the distant end, comprising precisely the same number per second as the air-waves which set them free, are made by means of the electro-motograph to vibrate a sounding-board a like number of times, and thus reproduce the original air-waves or sound. The apparatus for effecting this vibration is very simple.

A small hand-crank with cog-wheel attachments operates to give motion to the metallic drum of the motograph; a strip of paper moistened in a solution of sulphate of sodium is carried over the surface of the drum. A sounding-board (an old style dulcimer is used) is stood upon edge, and a brass arm fastened rigidly to it projects outward to the center of the drum, lying parallel with it. A steel spring with platinum face is fixed underneath this arm and made to bear with considerable pressure upon the paper immediately over the center of the drum, by means of an adjustable screw which passes through the end of the arm. Now when the drum is revolved outward from the sounding-board, the paper is drawn under the platinum-faced spring attachment of the arm, and the sounding-board is drawn outward by means of the friction imposed. The current coming over the wire from the distant station, passes through the paper, destroying the friction, and thus permitting the sounding-board to drop back to its normal position, and the cessation of this current permits the friction to be again imposed, and the board again drawn out. This treble electro-chemical and mechanical action is so instantaneous that the finest and highest notes of the female voice are perfectly and audibly reproduced 200 miles from their source of origin upon a single wire of No. 8 gauge. Of course a static induction compensation is used to permit free passage of the electrical impulses through the wire.

Mr. Edison has also just perfected a speaking telephone, which reproduces the

human voice over great lengths of line with marvelous accuracy and distinctness, by means of which conversation is carried on with great facility. Reiss, a German, Mr. Edison, and A. Graham Bell are the only persons who have ever grappled with this problem. Reiss, in 1866, succeeded in transmitting musical tones and some spoken words. Edison and Bell began experimenting in this direction about the same time, and each have succeeded in producing that which is characteristic of them. Bell's apparatus is the beautiful realization of a theory, but too receptive to outside or foreign electrical influences to be effective in their vicinity, and it is just there, in large cities netted with electric circuits, that the telephone is of value. Edison, using the regular battery, has a direct force commensurate with the work to be done and the foreign influences to be overcome, and can thereby give the volume of sound, and obtain the freedom from confusing effects, which brings effectiveness and marks his telephone with the practical stamp of all his inventions. Mr. Edison is also perfecting an automatic translator which, when adopted, will prove of great value toward cheapening telegraphy. It will enable one operator to do the work now done by two. He is also engaged in perfecting a sextuplex by means of which six messages may be simultaneously transmitted over a single wire; and lastly, he is at work on a machine for recording the human voice and reproducing it at any future time, by which we may all be able to speak after we are dead. This, of course, seems almost beyond the bounds of belief; yet it has been already accomplished in part, as many persons are ready to testify.

THE DEVELOPMENT OF THE EARTH AND OF EARTH-LIFE.

First Paper.

THE earth, it is probable, once formed a part of our sun (as did all the other planets of our system), and was, at the beginning, in a state of igneous fusion. Its surface gradually cooled until it formed into a thin crust, which in course of time grew thicker, but so slowly that it measures at present but one-thousandth of the earth's diameter. That the interior of the globe is in a molten state is proved by the temperature of the crust gradually increasing toward the interior, viz., for every 100 feet the thermometer rises one degree. At a depth of 10,000 feet water boils; at forty miles deep the heat is estimated to be 1,800 degrees, where iron melts; and at seventy-five miles of depth all known substances must be in a liquid state. For further proofs of this internal heat, we are referred to the hot springs, geysers, and volcanoes.

The first solid crust formation was probably like a smooth, thin shell, surrounded by a fiery and dense atmosphere, in which water would only exist in gas form, and which was impenetrable to solar rays, so that the earth was inclosed in darkness. As the cooling went on, the molten interior was more and more condensed, the thin crust fell or broke in at many places, so that its surface became uneven and rugged. After the temperature of the surface had sunken to the degree at which the vapor of water is condensed, the first water appeared, and the falling rain began to clear the hitherto turbid atmosphere. The primitive sea was impregnated with carbonic and other pernicious gases, and, like the surrounding atmosphere, in a hot condition.

The first layer which surrounded the fiery earth-kernel consisted of the hardest rocks, granite, syenite, basalt, porphyry, etc., and of the heaviest metals. On account of its richness in siliceous rock, this layer is called the "silicate mantle," while the rocks lying directly inside of this mantle are called the primitive or plutonic rocks. Over the silicate mantle was formed, by the bursting through of the fiery liquid, a second or volcanic layer, which partly through refrigeration and partly through atmospheric pressure was crystallized, and is remarkable for its undulatory and slate-like structure. These volcano-neptunic formations are called slate rock or primitive clay-slate, and

consist principally of gneiss, mica, and talc. Out of this layer was formed, through the decomposing power of water and air, the soil. In this soil, after the high temperature of the water and air had sunken so low that it would no longer destroy organic life, first plants were produced, and later, animals of the most simple organization.

Since that ancient time water has continued its extraordinary activity without interruption, and still is producing, slowly, but surely, transformations of the earth's surface. If this activity of the water were not interrupted by volcanic risings and sinkings of the earth-crust and by other occurrences, the surface would, in time, become even, and entirely covered with water. The reaction of the igneous liquid mass inside the earth causes an uninterrupted rising and sinking in different parts of the globe; and as this rising and sinking changes the contour of the surface, there is now one and then another part of the surface brought out of, or drawn under, water; and rocks are formed through organic and inorganic depositions which are of the most heterogeneous composition, mixed with vegetable and animal matter. Plants and animals are continuously at work to raise the bottom of the sea; in the shallow parts of the sea are the shells and corals, and in the lower or deepest parts are the microscopic diatoms, polythalamias, and cellural animals, which by myriads aid in the precipitation of the silicious and calcareous earths.

Those matters which are precipitated in the water usually by layers are called sediments, therefore all the earth-layers above the primitive slate are called sedimentary layers, stratified rock; the essential parts of those layers are argillaceous (clayey), silicious (flinty), and calcareous (limey) earths, which caused the formation of the clay, sand, and lime-stone. These more or less concentric strata or earth-layers have different thickness, form, and structure in different parts of the earth, having been at times displaced and reticulated by underlying rocks. But between these different sedimentary layers are no sharp boundaries so as to justify the theory of earth-revolutions from time to time, which destroyed all and every existing thing, so that after such a catastrophe an entirely new creation had to begin.

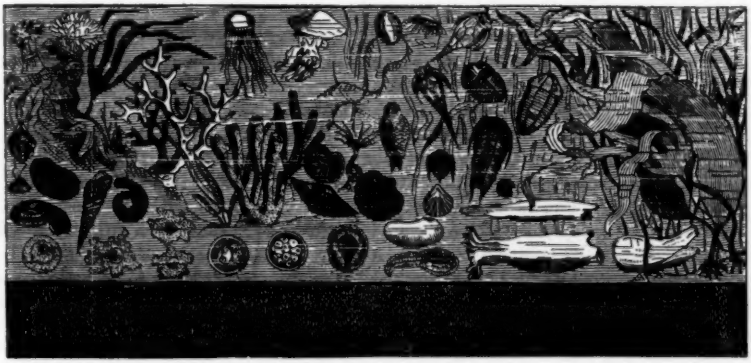


Fig. 1.—Life in the Primordial Age. Seaweed and Headless Animals.

The rising and sinking of different parts of the earth-surface went on, so that in the course of untold ages probably no part of it exists which has not been repeatedly under and above the surface of the sea. This manifold changing explains the variety in the composition of the numerous neptunic strata, which in most parts are found of considerable thickness. These strata form together a crust of about 130,000 feet thick, and are by geologists divided into five groups and periods, each one having its subdivisions or systems, which again consist of smaller groups or formations.

The principal divisions are: 1, Primordial

Age. 2, Primary Period. 3, Secondary Period. 4, Tertiary Period. 5, Quaternary Period, or Post Tertiary. The difference of zones, which is at present so very distinct, did not exist before the quaternary or present period; there was but one climate, that is, an equally hot one, which was probably somewhat hotter than the middle-tropic climate of our present time. As is shown by the remains of plants and animals, the highest north was once covered with palm, tulip, and myrtle trees, and other tropical plants, and also inhabited by elephants, rhinoceroses, tigers, etc., etc. Very gradually the heat diminished, and not before the tertiary period does the effect of refrigeration become perceptible at the poles, where occurred the first division into climatic zones. During the tertiary period the cooling advanced so far that the first ice appeared at the poles.

This change of the climate had an enormous influence on organic life, and caused partly the extinction of those organisms which could not adapt themselves to the cold, and partly their immigration into warmer climates. In the diluvial time the temperature was still continually sinking, and, from the north pole, the cold spread over Northern and Central Asia, Europe, and the northern part of America, and produced a solid ice-crust, which in Europe reached down to the Alps. From the south pole the ice spread over a great part of the southern hemisphere, and there was only a small zone left between the two frozen seas on which enough warmth was left for organic life.

This part of diluvial time is usually called the Ice or Glacial Period, and during its continuance man came into existence. Our knowledge of this glacial period has been obtained through the so-called wandering or erratic blocks, and through the glacial movements, the meaning of which was first explained by Schimper, and subsequently by Charpentier, Agassiz, and Forbes. These erratic blocks were recognized as rocks which had been transported by ice masses from their original home to distant places. Very slowly the sun asserted its power over that frozen ocean and brought about our present distribution of zones and seasons. But more than one glacial period seems to have existed, even repeated changes of temperature from warm to cold in both the northern and southern hemispheres. These glacial periods are the most important unsolved problems of geological research.

Within the different layers or strata of the earth-crust which were formed by aqueous deposit are found relics of organisms of so different a nature that one with certainty can perceive how each of the layers was inhabited by different plants and animals. In the stratified rocks the fossil relics of plants and animals exhibit a gradual transition, more or less distinct, from the lower into the higher layers. In the lower strata the relics of more simple and imperfect plants and animals are imbedded than in the higher strata, and the higher up the fossil organisms, the more they resemble present organized life. With the increasing thickness of the earth-crust living creatures appear to have gained in variety and perfection.

In consequence of the manifold changes wrought by the rising and sinking of different parts of the earth, in the course of ages, strata containing remains of animals and plants long extinct were brought to light; and in the different periods when the cadavers of these organisms sank to the bottom of the waters, the forms of their bodies were impressed in the soft mud and incorruptible parts, like bones, teeth, and shells, were imbedded, so that these are found now as fossils or petrifactions in the neptunic rocks.

Palæontology, or the science of the ancient life of the earth, for early researches in which we are indebted particularly to Cuvier, gives us, with the aid of these fossils or petrifactions, information with regard to the development through which animal and vegetable life have passed from the beginning. It divides the groups of organisms of our earth into five eras or ages corresponding with the geological strata, viz.: Primordial and Primary, Secondary, Tertiary, and Quaternary Periods.

Of man, fossil bone relics are found not only in the quaternary period, but even before the glacial in the middle tertiary period, and usually in connection with more or less

perfect tools, implements, and arms. At the beginning these were fabricated from rough stone, later from polished stone, then from bronze, copper, burnt clay, and finally from iron.

Of fossil human relics the parts especially found are lower jaw-bones and skulls, as the lower jaw, from Nanlette, Martin Quignon, Hyeres, Arcis-sur-Aube, the Neanderthal and Eagis skull, etc. The fossil man of Denise and Natchez, on the Mississippi, must have lived in the time of the mammoth.

That part of our earth's crust which was formed by gradual layers of sedimentary and stony masses, brought about by disintegration of the primary or slate rock and its precipitation, contains the fossil relics of almost every organism which has existed upon the earth. Geologists distinguish in these stratified sediments the following five epochs or ages:

First. The Primordial or azoic time, the Acephalic or headless age, or age of sea tangwood, the Archæolithic or archæozoic age. (See fig. 1.)

This period lasted much longer than all the other ages together; its layers are upward of seventy thousand feet thick, and form three mighty neptunic systems, viz.:

1. The Laurentian system with Labrador, with silicated, argillaceous, and calcareous earth with a particle of natrium and the Ottawa formation, thirty thousand feet in thickness, having, on the upper part, calcareous earth and shells, and below, gneiss, quartz, conglomerate and granulous calcareous earth.

2. The Cambrian system in middle Primordial time, about eighteen thousand feet in thickness, consisting of upper and lower Cambrian layers, which include the deepest graywack, commencing with slate, followed by calcareous stone, and including light-colored sandstone.

3. The Silurian system, in latter Primordial time, about twenty-two thousand feet in thickness, consisting of upper, middle, and lower Silurian layers with glimmery graywack, black slate, and lamina-formed argillaceous sand and lime stones.

The Primordial time contains in its Cambrian and Silurian layers plainly preserved petrifactions, especially of calcareous animalcules, foraminifers, which prove that in that time no land organism existed. Logan discovered, in 1865, in the lowest Laurentian layer, Ottawa formation, relics of an organism called aurora animalcules—*eozoon canadense*—because with them begins, in science, the dawn of life on earth. But this little animal, and likewise the Rhizopods, do not belong to the simplest form of animal life, because they are inclosed in a calcareous shell, whereas the simplest animal organism, the *moner*, consists only of a cellular slime or plasma without shell or muscle. There are found also in the lowest sedimentary layers relics of organic life, of which it is not known whether they belong to the animal or vegetable order. All vegetable relics of primordial time are tender cellular plants, and belong to the lowest of vegetable groups, to the seatang and algæ. They formed in the warm, primordial sea, mighty

Fig. 2.—The age of Fishes, Ferns, and Stone-Coal. Primary Period.

forests of seaweed, and were of a leathery nature, brown or red in color, without leaf and blossom, and swam loose in the water. The animals of this period also lived in the water; they were crustacean, like the Trilobite, the oldest of crabs. The fishes, which followed the crustaceans, were similar to the shark and turtle, cephalaspides and cœlacanthines. There were the skulless animals, Acrania, headless vertebra, besides the simplest primeval animals, Moneras, Amœba, Infusorias, Ascidians, Apodas vermicular Graptolithus, Radiatas, Polyps and mollusks. In the Silurian formation, among the most remarkable remains are the Graptolithus, which are similar to a spirally rolled up saw-blade.

Second. The Primary or Primitive period, the age of fishes and fernwoods; the Palæolithic or Palæozoic age, with vast strata of a thickness of 42,000 feet, divided into:

1. Devonian system (older primary time), with layers of limestone, marl, and sandstone. The Devonian and Silurian systems together are called Transition rocks or older and younger graywack formation.

2. The Carboniferous system (middle primary time), with coal, carboniferous limestone and carboniferous sand.

3. The Permian system (latter primary time), with younger red sandstone above the coal, and under the upper and marl slate; above the latter one is the zechstone or dolomite.

Primary time is rich in blossom and fruitless land plants, especially ferns, ferntrees, etc., of which the fossil relics are known as stone-coal. (See fig. 2.) Of animals there is a great variety in this period, especially of fishes, similar in form to the shark, and with a thick coat of bony plates; winged fishes with loricated body and wings, and salamanders. Of land animals there exists the articulata, arthrozoa (spiders and insects), and some vertebrata (amphibia and reptiles) nearly related to our lizards, as the Proterosaurus, Archegosaurus, etc. This time was generally the commencement of the transformation of the fish-like body into an amphibious, after the vertebrated animals had been replaced by the invertebrated or articulated animals.

The trilobites became extinct during this period, and formed the transition to the fishes (cephalaspis),

During the primary time the series of animals which breathe through the lungs commenced.

EDUCATION AND RELIGION.

EVER since the advent of man he has not ceased to acquire information and add to his stock of knowledge. This feature appears to be one of the distinguishing peculiarities of his nature. While the lower animals soon reach the extent of their intellectual capabilities, and that point beyond which they can never advance, man, on the contrary, is always progressing in intelligence, accumulating fresh stores of learning, and augmenting his ability to command the objects and forces of the external world. So that the history of our race presents the record of his wonderful progress.

Although every age illustrates the fact that man has always been eager in the pursuit of intellectual acquisition, perhaps no period discloses this state of mind more decisively than the age and country in which we live. Our own nation, as much as any other civilized community, displays this laudable ambition and the desire to refine the powers of the intellect, to expand their capacity, and multiply the sources of mental wealth. The means of education and improvement probably never existed in greater abundance than now, nor were they ever better adapted for rendering the mental faculties powerful and efficient. The institutions and facilities for learning are continually supplied to meet the demand, so that the sun of knowledge is constantly shining upon every quarter of the land to disperse

the shades of ignorance and illuminate the state of intellectual night.

It would be extremely difficult to estimate the value of learning or compute its loss. There are comparatively few persons, either old or young, who at any time view the problem in both these aspects and arrive at any sound or satisfactory conclusion. The danger of ignoring the benefits of education is perhaps much less than the other extreme of exalting its advantages beyond the bounds of reason, for in addition to the intellectual faculties being naturally active, they are also stimulated to exertion by incentives offered to Approbativeness, Acquisitiveness, and Self-esteem. And besides, the exercise of the intellectual powers themselves being attended with a positive pleasure, it is seldom we find an individual throughout his life neglecting to make some endeavors to obtain at least a moderate amount of knowledge. Indeed, it would be very anomalous for any one living in a community, especially an intelligent community, not to add in some measure to his intellectual possessions. No writer, either ancient or modern, ever had the audacity seriously to celebrate the praises of ignorance, and if a specimen of such an author were extant, it would possess the singular distinction of being best known for its rarity.

Contrast this view of the subject with that now to be offered for consideration. The inestimable blessing of education, in all its varieties and modes, is probably more obvious to an enlightened phrenologist than to any other person unacquainted with the true philosophy of mind, because the science discloses the individual faculties of the mind, estimates their size, power, and activity, and furnishes specific information of the different kinds of knowledge best adapted to direct and enlighten the faculties themselves, individually and collectively. Besides this, it demonstrates the relative value of culture, whether it be addressed solely to the intellect or through it to the moral and religious sentiments. It is therefore not a eulogium too high to dignify the science as the alphabetical key to the cyclopædia of education in its most comprehensive sense and utmost reach.

It is not our intention here to extol the benign influence of knowledge, or to attempt to exalt the justness of its claims. Neither do we propose in any measure to disparage a mind endowed with the most splendid intellectual capacities, which may have been cultivated with becoming diligence in acquiring every species of learning and accomplishment which can command the respect and admiration of profound scholarship. In the above sentence, however, we refer only to that description of knowledge which is addressed simply to the intellectual powers —the perceptives and reflectives—omitting all reference to religious knowledge, or that addressed to the religious emotions. Our immediate object is to invite the serious attention of the reader to a general survey of that kind of culture and refinement of the mind which is described in the term education, and to draw a comparison as to the merits of such knowledge with that which is more peculiarly the property of the religious emotions, and then, if possible, to convince him of the real nature of the one and help him to reflect upon the supreme importance of the other. We must first distinctly concede all the benefits and advantages which can by any means flow from a liberal education, and which can be imputed to it by the most strenuous advocate.

We must also assume as a fact, what will be universally admitted, that it appears to be one object of the Deity in our creation to enable us to attain happiness, because our constitution is admirably adapted both to pursue and enjoy it. And secondly, that the sum of man's desires gravitates toward the attainment of pleasure and happiness; for it can not be supposed that a rational creature would willingly covet pain, unless it were the channel by which he hoped to balance the account by a greater amount of enjoyment ultimately accruing to himself or others. Experience emphatically assures us that man is not happy in proportion to his knowledge, or the things he knows, for if he were, the world would soon be converted into a vast seminary for cultivating the intellectual powers and multiplying the means of expanding that part of our nature. The most enthusiastic will confess the truth of these

remarks. No matter how capacious a man's intellectual powers may be; no matter how comprehensive or profound his researches; no matter to what extent he may have improved his advantages in acquiring a knowledge of the arts and sciences; notwithstanding all this, we have the explicit testimony of the most enlightened scholars that literature alone does not supply the deepest aspirations of the mind or confer upon it the most solid satisfaction.

To support these assertions, we here cite the beautiful language of an author eminent alike for the depth of his piety and the superior character of his intellectual abilities. He says: "As the material part of the creation was formed for the sake of the immaterial, and of the latter the most momentous characteristic is its moral and accountable nature, or, in other words, its capacity of virtue and vice, that labor can not want dignity which is exerted in improving man in his highest character, and fitting him for his eternal destination. Here alone is certainty and durability, for however we may estimate the arts and sciences which polish our species and promote the welfare of society, whatever reverence we may feel and ought to feel for those laws and institutions whence society derives the security necessary for enabling it to enlarge its resources and develop its energies, we can not forget that these are but the embellishments of a scene we must shortly quit—the decorations of a theatre from which the eager spectators and applauded actors must soon retire. 'The end of all things is at hand.' Vanity is inscribed on every earthly pursuit, on all sublunary labor; its materials, its institutions, and its objects will alike perish. An incurable taint of mortality has seized upon and will consume them ere long. The acquisitions derived from religion, the graces of a renovated mind, are alone permanent. This is the mystic inclosure; this is the field which the Lord has blessed; and this word of the kingdom, the seed which alone produces immortal fruit, the very bread of life, with which, under a higher economy, the Lamb in the midst of the throne will feed His flock and replenish His elect through eternal ages."

These sentiments are entirely consistent with the philosophy of Phrenology, and moreover recommend themselves to the dictates of sound wisdom. The author above quoted is profuse in his praise of literature, and wrote an admirable eulogy on the advantages of knowledge; but he incessantly insists upon the greater efficacy and virtue of moral and religious truth for promoting and perpetuating the chief end of our existence, which is admitted by all Christian communities to be a destiny of eternal duration, where the nobler attributes of the mind may have amplitude for infinite display.

If the immortality of *all* men in a state of bliss were not involved in obscurity and doubt, all religion, except natural religion, might be justly discarded, and the pursuit of knowledge compose the object of all his hopes and exertions. But no sensible person can close his mind to the reflection that the final destiny of all mankind may not be one of happiness; and while the veil of mystery hides the future from our view, it is not an act of wise discretion to remove the consideration of these questions till necessity compels us to entertain them. There is a period in our history when the contemplation of death and its effects will arrest the sentiments, the affections, and the powers of reason, and the anxious desire to look into futurity will then absorb all other interests.

Mr. Joseph Cook, of Boston, in his lecture on the question, "Does death end all?" solved it, we think, by an analogical argument in which he inferred from the supposed qualities of matter and mind, that death does not end all. But the most beautiful and forcible hypothesis for the immortality of the soul, is that derived from Phrenology, and one might naturally and boldly affirm, that from the constitution of the powers of the mind its survival beyond the grave is hardly a matter of speculation. And philosophers of both Christian and heathen systems, as well as the general consent of barbarous and civilized peoples, all concur in the belief and assumption that the spirit of man continues to exist after death. The question, however, requires to be narrowed, or at least examined in another aspect, not less important or less impenetrable. Even

admitting the immortality of the soul, yet the qualification of its immortality might adapt it as well for a condition of woe as for a state of bliss. To solve this problem, reason is confessedly inadequate. The only appeal is to Revelation, which combines the whole theme of immortality, asserting the reality of the prospect, but limiting the scope of its operation. While the Bible nowhere distinctly promises a happy futurity to unbelievers and the finally impenitent, it positively declares that state to such as are penitent and conform to its precepts. So much is certain in addition, that the creeds of Christendom generally ascribe a higher stage of existence after this life, not to all, whatever their faith and practice may be, but to those only who lead a true religious life by subduing the propensities, and who sincerely cultivate the moral sentiments of Benevolence, Veneration, Conscientiousness, Hope, and Spirituality; or, in other words, those who manifest the true spirit of piety. This is the doctrine, with modifications, entertained by the Church for eighteen hundred years, and is still inculcated by men of the highest intellectual and moral endowments; by men, too, whom Phrenology characterizes as possessing all the faculties which are requisite to form a comprehensive judgment, such as is most in harmony with enlightened reason and Revelation.

The affirmed relationship, then, subsisting between immortality and religion is fortified by a cloud of witnesses, whose interpretation of such matters is entitled to great weight, if not implicit credit. Speculation may, of course, differ with these conclusions, but the greater preponderance of reasonable faith leans decidedly to the decision respectfully submitted in this discussion.

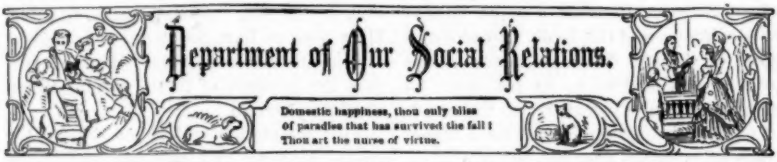
Since, therefore, it is destiny which gives to man and his prospects all their glory, it becomes a question of personal import whether the present age does not attribute a fictitious value to the mere cultivation of the intellect, to the exclusion of that species of knowledge which, the highest wisdom informs us, fits the immortal part of man for an abode of celestial and infinite duration. What is the proportion of time spent in a scholastic and college education and that dedicated to the acquisition of religious knowledge? Here we have intellect on the one hand and the moral sentiments on the other. The intellectual faculties are the great repository of facts, an acquaintance with which constitutes a knowledge of the sciences, but unless that kind of knowledge is allied with religion there is no assurance that it will not terminate with this life. Here also we have the moral and religious sentiments, whose habitual cultivation renders the prospect of future welfare all but absolutely certain.

That infatuation which can despise the greater treasure and only appropriate the less can only be characterized as blind imbecility, for the gulf which separates their interests is as wide as eternity. Learning is most intimately related to time; religion comprehends the affairs of time in those of eternity. Education, instead of superseding religious knowledge, which it often does in the estimation of its youthful votaries, draws its brightest lustre when subservient to a life of piety; for what ultimate benefit is to flow from the most brilliant scholarship, if death shall dissolve the mental powers and dissipate all conscious existence? Seeing that the grave may obtain such a complete victory over our body, and all there is of us may return to the elements, the most vital considerations suggest the concerns of sacred history as the sublimest that can occupy our contemplation. What if after devoting thirty, forty, or fifty years of life to compass a knowledge of science and literature, the individual finds at last that he has neglected those nobler themes which his higher sentiments were bestowed to explore, which would have augmented his secular enjoyments here and prepared him for scenes of loftier employment hereafter?

THOS. TURNER.

THE INNER WITNESS.—When we hear a beautiful song, we are moved by it. We may know very little about music. We may not be able to tell wherein the beauty of that song consists, or why it moves us. A musician might tell us that it was full of defects, and possessed no artistic excellence.

We might not be able to answer him a word; and yet we would know it was a beautiful song, because it touched a chord in our own souls which responded to the touch. It is not a thing to be proved or disproved; we have felt it, and we "testify that we do know." We do not need to understand the rules of music before we can appreciate a song, nor need we be able to discuss the principles of art before we can enjoy a painting. We feel the harmony of the one and the beauty of the other, because our souls were made to respond to them.


Department of Our Social Relations.
Domestic happiness, thou only bliss
Of paradise that has survived the fall!
Thou art the nurse of virtue.

MY HOME KINDERGARTEN.

No. I.

EDITOR OF THE PHRENOLOGICAL: The accompanying letters by my Aunt Penelope may be of interest and value to your readers.

AMELIE V. PETIT.

MY DEAR NIECE!—Poor in purse though rich in love, I trust the papers I have written out for you may prove as valuable a wedding-gift as those you will receive from many friends. Lovingly, PENELOPE.

When first it became known to me that the sacred office of motherhood was to be mine, my whole mind was engrossed with thoughts of parental duties and responsibilities. All the time that could be spared from domestic affairs was consecrated to that unknown being whose destiny lay so greatly in my power. Though ignorant of much a mother ought to know, a thorough education had developed my reasoning and reflective faculties, and, aided by a few books, I diligently applied myself to overcoming my ignorance.

"What," thought I, "can be done before my child comes for its physical well-being?" Mothers usually answer this question to themselves by making dainty, charming little garments, which look pure and beautiful enough to robe an angel. Well, this I too did. The fairy drapery was soon made, for I applied the principles which governed my own dress. The garments were of handsome material, neatly sewed. I dared not spend upon an infant's dress in costly, fragile lace, what would comfortably clothe many a motherless one.

Having learned that a mother's health would influence much the health of the future child, I took especial care in habits and diet, keeping my rooms well ventilated, protecting myself against cold by extra clothing if the weather demanded any change, and eating nothing very rich or gross, though avoiding too much solicitude upon the subject. Then I thought, "If one can influence the health and physical constitution of the unborn child, why may they not its heart and intellect?" So I decided to try endowing my child with those qualities which it seemed desirable for one to possess.

My temper was not violent or ungovernable, yet was not always curbed when it should have been. From that time, however, I watched myself and avoided every occasion of unpleasant disagreement or anger, trying to think gently and kindly of everybody, and, as far as possible, keeping my mind calm and tranquil.

My household duties were performed with neatness and regularity; then I devoted my time to reading, music, and drawing, trying always to interest myself deeply; to

give my whole attention and thoughts to my pursuits; to impress upon my soul the lofty and noble ideas of my books; to fill my mind with the harmony of music, or stamp upon my memory the beautiful forms I was imitating in drawing. Especially did I devote myself to reproducing with my pencil pure and noble human features. I purchased some beautiful prints of cherub heads and hung them in my sitting-room, where my eyes could turn easily to feast and dwell upon their loveliness.

I loved the works of nature, landscapes, flowers, clouds, trees, all with perfect passion. I spent much time formerly in contemplating the perfection and grandeur of creation, and now debarred from general society, turned with redoubled ardor to the beauties of the spring-time. I climbed the hill-side, followed the windings of the river, gathered the trailing arbutus from among the dead leaves of the last summer's glory, and watched day by day the changing foam-wreaths of the clouds as they shadowed or brightened the glorious blue of the far-away firmament. I rejoiced in Nature with all my heart. Thus the months went by; and when the dying June cast away the fading petals of her brightest roses, my dark-eyed child lay beside me. How I loved, even then, the fragile, pink-tinted human flower the Holy One had given me to prepare for the coming and endless beyond.

When the novelty of the child's coming was over, and friends had commented upon its size, its eyes, and its hair; when those who wished to flatter had called it the sweetest, brightest babe that ever was, and my husband, patting my cheek, had said, "No matter, plain or pretty, the little thing is ours;" when all this was over, and I once more occupied my place in the sitting-room, and the child had attained the dignity of a crib, my thoughts turned to the future culture, the moral and mental training which must soon begin. I then matured a systematic plan for her education.

My watch over my temper did not relax in vigilance, for it seemed important that my child should never see me ungovernably angry or habitually cross and petulant. Children imitate so readily, and imitation soon becomes second nature. I feared a disobedient, disorderly household, and spared no trouble or sacrifice to render mine different. Unless order and good-nature are present in a house, there can not be peace and happiness.

My husband was one of those noble souls, so rare on earth, gentle, affectionate, sincere, endowed with a firm, well-balanced mind, diligently cultivated; not a genius, but possessing a high order of talent. He was ever ready to support my authority, though never interfering in the government of our children, believing it a mother's office to model and control the offspring so peculiarly hers. The discouragements so many mothers have to contend with were spared me. Frequently have I seen the husband of a friend take from her arms a child she was endeavoring to subdue, and fondle and pity it; this, too, when she was perfectly right in the punishment administered. The result was, the child contracted a feeling of contempt for his mother's authority, and now, at the age of fifteen, openly sets both parents at defiance.

Even though one parent may sometimes be a trifle harsh and severe to a child, it is infinitely best that the other should acquiesce and treat the offender as an offender until the child is subdued and restored to favor. My husband believed in and trusted me, and his evident confidence in and regard for me gave me added importance in the eyes of the children and servants.

When Dora began to show indications of dawning intelligence, my work commenced anew. She was always addressed gently; harsh sounds and unkind words were strangers to her ears. The servant was not permitted to play roughly with her or talk what is known as "baby-talk," a mixture of false pronunciation and silliness. I do not object to an infant being addressed in playful, endearing words, though they may be trifling, but that jargon in which a foot becomes a footy, an apron an apy, a father a faddy or daddy, is only calculated to teach the child a corrupt pronunciation of language which will afterward require great labor to correct.

It is best, even in the first year of a child's life, to address to and teach it such words as are proper and most elegant. A child will as readily learn to say "I have not" and "I can not," as "I haint" and "I can't;" "I dislike," is as easily acquired as "I can't bear it;" "I think so," as "I guess so." Every one should learn from the earliest childhood to prefer that which is most beautiful, best, and wisest in language, conduct, and dress. The pure, the beautiful, and the good should always be sought. It has been quaintly said that "purity, beauty, and truth are three sides of one eternal prism, of which the presence of one presupposes that of the other two;" and it is true as regards language; pure language indicates pure thought, and pure thought indicates pure actions and a pure life.

When twelve months old Dora began to partake of the simpler dishes of our food; previously she had eaten only milk, bread, rice, and ripe fruit. Now she sat at table, and I gave her what I deemed it fitting she should eat, not allowing her gravy, butter, meat, pastry, or cake. I myself ate sparingly of these articles, confining myself almost wholly to vegetable food and brown bread. The digestive powers of a child are not as strong as those of a grown person. It would be strange if, weak and feeble in every other way, a child could yet eat advantageously the food that might be of advantage to a strong man.

I wished my child to grow up as handsome as possible, and I know that coarse forms and features and bad complexion are caused, in great part, by gross food. Plain, nutritious food taken at proper times, in proper quantities, accompanied by free and frequent exercise in the open air, prevents indigestion and dyspepsia with their attendant yellowness, and will promote a clear, ruddy complexion, sparkling eyes, a bright, pleasant expression of countenance, a free, springing step, and pure, happy thoughts. Many people say, "Children will eat these forbidden articles when grown, and hence may as well have them when children." I say, not so; they may eat almost with impunity in maturer years what would seriously injure them when so young. To late suppers and insufficient or improper exercise may be attributed the early-fading beauty and almost invariable ill-health of many American women.

After the first two months of Dora's life, she was taken out in the open air every day when the weather permitted. Air, and pure air, is the first essential of life, and young children require it even more than their elders.

As my child grew older I tried to impress upon her mind the value of exercise, and she was not only allowed, but urged to play at some active game several hours daily. I did not give her a doll, as a matter of course, to spend her little thoughts upon, but balls of various colors, teaching her the name of each color. Next she had colored blocks with letters upon them, and she was taught to select the blue A, the red A, or the green B, or the yellow W. Thus the large and small letters were all learned without any conscious effort or any childish heartache. While teaching her the letters, I also taught the name-sound of them, and by degrees all the prominent sounds, thus insuring correct enunciation while her vocal organs were flexible.

Children are too often told that they are spending precious time when at play, and might better be employed in reading or sewing. This is all wrong. Young persons require exercise for their proper development, physically, mentally, and morally. They should, as far as possible, be kept care-free, healthy, and happy. Sorrow comes soon enough. Let every one, then, have in their hearts the memory of a pleasant childhood, when they were treated with love and tenderness. Give them every proper indulgence of their tastes and social affections; teach them by example and precept the charm and beauty of love, truth, and virtue; they will always be better, happier for having once been truly happy.

Girls take too little active open-air exercise. At ten or twelve years of age, their mothers begin to tutor them about romping and playing so much; the result is, girls at fourteen are staid and quiet, with their animal spirits almost wholly subdued.

Playing grace-hoops, tossing ball, running upon the lawn would be considered by the young misses as very childish and improper. If a child thus tutored still retains a lively, brisk gait and springing step, she is continually reminded of Mary, or Lucy, or somebody who is *so* gentle and lady-like. Even to the age of twenty years, children should devote some hours daily to sport, mere pastime. It is good for both mind and body to rest frequently, sometimes to be even idle, that wearied nerves and brain may have time to recuperate. Riding on horseback is excellent exercise for young girls, and daily walks should be continued throughout life.

During these years when playing so much in the open air, some care of the complexion is necessary to preserve the beauty. Nearly all children are pretty, or, at least, pleasing-looking, because of their fresh faces, and free, graceful movements. There is no reason why they should not grow up pretty, if they only know how. The face should be guarded from the cold, sharp blasts of winter and the rough winds of February and March. If tan and freckles are kept from the face during the first fifteen years of life, the complexion will not require so much care afterward. "Beauty is ever that divine thing the ancients painted it;" and though it sometimes proves a fatal legacy to an ill-trained, weak minded girl, yet it is oftener a blessing than otherwise, and mothers ought to strive by all proper means to make their daughters beautiful and engaging as well as virtuous and truthful. Beauty may be greatly promoted, may almost be created, by a mother's care and knowledge. By proper food, fresh air, good temper, exercise, and moral and mental education, any child having tolerable features may be made pretty if not beautiful. Our children did not inherit beauty, for neither parent could claim more than passable faces, yet they are esteemed more than ordinarily well-looking. I attribute their beauty in great part to the care bestowed upon them. Beauty of expression is the most enduring and highest kind of beauty, and the expression of the face is undoubtedly more capable of being controlled and improved by culture than is fairness of complexion.

Every day we see faces ugly and distorted by crossness, anger, melancholy, revenge, and sensuality which were once bright and lovely with the innocence and smiles of childhood. What has changed them so greatly, if not coarse food and bad passions? Every cross, jealous, proud, angry feeling, like every blow of the chisel upon marble, serves to carve a line upon the features, and each time such feelings are indulged, the work of the invisible carver is deepened until the face is made ugly by unkind and unholy thoughts and feelings. In a similar way kind, pure thoughts, gentleness of word and deed leave their impress, making bad complexions and common features almost radiant with the beauty of goodness.

Education, not alone intellectual, but also moral education, increases beauty. A countenance beaming with intelligence, united to a gentle, winning manner, will always be thought handsome by sensible people, and this beauty will endure and grow throughout life. Any one may prove the truth of this statement by noticing the ignorant, vicious children who are sent to a School of Reform where they are properly fed and instructed. Day by day as they receive new ideas of right and wrong and think new thoughts, their eyes brighten, and the whole expression of the face becomes so changed as to pass unrecognized by those who had formerly known them.

How noble are the faces of most men known for their culture and genius; so noble that, in any crowd, they would be noticed and remarked though unknown. It is not that they are, in the common acceptation of the term, handsome men, but it is because education and intelligence have wrought upon their features until they are grand as the sculptured faces of heroes and demi-gods.

To physical education I always attached great importance, not only as promoting health, but also gracefulness and beauty. An erect and pleasing carriage of the body and head adds vastly to the appearance of child or adult, and can be acquired by

practicing throwing back the arms and shoulders a few minutes each day, walking upright with a moderately heavy weight upon the head, calisthenic exercises, with music and dancing. Many young persons acquire an ungraceful manner by stooping over their desks at school, the shoulders droop, the neck and chin are thrust forward in a very ugly way. Pupils should not be allowed to bend over their desks except in drawing and writing; then they should bend at the waist, not crouch down from the shoulders. Too much importance can not be attached to the perfect development of the form; the health of the lungs and other vital organs depends so greatly upon erectness of the figure and expansion of the chest that no care or vigilance should be spared to ensure them.

Implicit and unquestioning obedience was one of Dora's first lessons. When she began to talk, and I was confident she could understand me when I gave her any order, I paid strict attention that she did what was directed. Mothers often teach their children disobedience by laxity in enforcing commands, ordering certain things and then taking no notice whether the order is obeyed. Children are very observing, and when they notice that their disobedience passes without censure, they conclude it was of little importance, and the habit of disobedience thus formed increases rapidly. It is much more difficult to reduce a child to obedience than to bring it up to obey. It will be found very difficult to make a noble, well-educated man or woman of a disobedient child. I made it an invariable rule with Dora not to grant to a repeated request what judgment had once denied. Occasions sometimes arise when one may reconsider and allow what has been previously forbidden; but a child should not imagine that indulgences may be gained by teasing, by tears, by violence, or by crossness.

If a request is to be granted, let it be done promptly as if it were a favor conferred with pleasure; if it must be denied, let it be denied firmly, yet kindly, giving the child to understand that the denial is made not to thwart its wishes, but because it is right to deny them. Children should be taught to believe in their parents to such an extent as to think there is good reason for not granting their requests if it is not at once revealed to them. They must not imbibe the idea that they are refused through caprice or idleness; a child should have perfect faith in its guardians. Parents should anticipate their children's little wants, and surprise them by gratifying their unexpressed wishes. If young people believe their parents are willing and anxious to make them happy, they will much more readily comply with parental requirements and submit to parental restraint than if they imagine their parents are only task-masters who impose restraints merely for their own pleasure and convenience.

When Dora spoke quite plainly, I began teaching her to repeat each day some little phrase, as, "Speak the truth," "Do right," "Be kind;" thus exercising her memory in words and thoughts she understood, and teaching her correct forms of expression. I furnished her now with sets of blocks for building a house, a church, a fence, and a car. These were an unending source of amusement and instruction. She learned by them order, regularity, shape, and design. When tired of them she was obliged to put them back herself in their box, and she also laid her little clothes away each week in their drawer. I remembered that "as the twig is bent the tree is inclined."

LONGEVITY OF NOTED LITERARY WOMEN.—Miss Jane Austen died 1816, aged 42; Mrs. Radcliffe, 1823, aged 59; Miss Mitford, 1855, aged 69; Mrs. Trimmer, 1810, aged 69; Miss Jane Porter, 1850, aged 74; Mrs. Elizabeth Montagu, 1800, aged 80; Mrs. Piozzi, 1821, aged 81; Mrs. Barbauld, 1822, aged 82; Miss Edgeworth, 1849, aged 82; Lady Morgan, 1859, aged 82; Madam d'Arblay, 1840, aged 88; Miss Hannah More, 1833, aged 88; Mrs. Marcet, 1859, aged 89; Miss Joanna Baillie, 1851, aged 89; Miss Berry, 1852, aged 90; Mrs. Somerville, 1872, aged 92; Miss Harriet Lee, 1851, aged 95; Miss Caroline Herschel, 1848, aged 98; Lady Smith, 1877, aged 103—giving for the 19 literary ladies an average age of 81.

POPULAR SHOWS AND SPECIAL GENIUS.

SINCE last February, when an immense concourse of colored people witnessed the exhibitions of the Carnival in Memphis, the spectacular spirit has been growing among them, and manifesting itself in all sorts of humble imitations, carried out on a larger or smaller scale. In the progress of mankind from a savage to an enlightened condition, there are as many grades as mark his passage from infancy to manhood. The colored people when emancipated were very much like children, highly credulous, with but little idea of responsibility, and exceedingly dependent on the educated people, who in owning them had provided for all their material wants. Of course, this in part at least resulted from their long enslavement; but any people from whom progress is shut off, as it once was from the serfs of European despotisms, evince the same traits; and people in such a mental state invariably display a great avidity for spectacles. Such is the case to this day among the stolid and unprogressive people of India, as well as the lower and more ignorant classes in Italy and France, and such was strikingly true among the French people in the reigns of Louis XIV. and XV preceding that tremendous popular agitation that followed the teachings of Voltaire and Rousseau.

Well, our poor colored people here in the South are children of no larger mental growth than those peasants of Europe and Southern Asia. They are therefore naturally mercurial in temperament, and dear lovers of excitement in any shape and form. Oh, how they all love coffee! and as for whisky, every man, woman, and child of them will drink it whenever he, she, or it can get it. The warm season of the year is generally a time of religious excitement with them—their protracted meetings begin with "laying by" their crops, and last till cotton picking gets to be too serious a business for hard-working "hands" to sit up till midnight every night shouting, singing, and praying at the tops of their voices. Last summer they had the *Spectacular* excitement. A place of rendezvous is selected, a basket-dinner provided, "marshals" and other officers named, and a long train of wagons, with following of people on horseback and on foot, form a procession, which marches through the neighborhood to the sound of music and so proceeds to the picnic ground. These wagons are modelled after the platform cars on which appeared the *tableaux vivants* of *Mardi Gras*. Wooden pedestals are placed in the wagons, draped, painted, and ornamented with garlands; and on the canopied seat at the top is placed a "queen" of love and beauty. There are three or four queens in a procession, each dressed fantastically in gauze and tinsel, flowers and feathers. Banners also are borne; the "cavalry," bedizened with wooden swords, prance along four abreast, and the poor little Sunday-school children and the young women, all decked in their "Sunday-go-to-meetings," trudge in the dust and hot sun with the patience which long habit has trained them to endure in the fields. There is tremendous drum-beating for days and nights preceding the "Picnic," and that day is ushered in and closes with noises of all instruments the darkeys can muster and control. The Sunday-school children always drill beforehand, expecting to "repeat poetry and sing songs," but when the picnic ground is reached and the baskets opened, nothing more is heard above the multitudinous hubbub but the big drum. These picnics are expensive to the colored people, who strive to outdo each other in their viands and costumes, which run up large sums with the frequent outlay. They have even averaged two large picnics a week. In this connection I must give you an incident that has a bearing on Phrenology. As Mr. C. and myself sat on our piazza one night awhile since, some colored people from a picnic passed our gate, carrying a large accordeon. Mr. C. called the accordeonist in and asked him to play for us. He modestly complied, when we soon discovered that he possessed quite unusual skill. I asked him his name. "Richard Simmons," he said, "a native of Alabama." "Who taught you to play?" "No one; I never had a lesson in my life." I

said to Mr. C., "Now we will have a fresh proof of the truth of Phrenology. You remember Blind Tom's face, with that peculiar fullness just above the eyebrows? Let us see if there is anything similar in this man's face."

Richard sat in the shadow of the morning-glory vines, which draped the piazza, and in the pale moonlight his features were scarcely discernible. I brought the lamp, when lo! he sat revealed!—an ordinary-looking colored man, with large, coarse features, a pleasant smile, and the peculiar frontal projection over the exact location of Tune, whence the forehead somewhat abruptly retreated. I afterward learned that he can play on several other instruments with equal ease and skill; though with the peculiar modesty of a special genius, he supports himself as a field-hand, playing for the darkeys at the picnics without charge.

VIRGINIA D. COVINGTON.

S. C. HALL.

A LITERARY PAIR.

MR. AND MRS. S. C. HALL.

THE lady and gentleman now presented in portrait have been prominent in literary life for so many years, that we need scarcely more than point to the venerable but lively-looking lady and say, "This is Mrs. Hall," and to the bright, well-preserved, clear-featured gentleman, and say, "This is Mr. Hall." Perceptive talent is strongly marked in both, and those well-defined, clean-cut noses have physiognomy in their favor, as indicating highly cultured, symmetrical minds. Mr. Hall's intellect possesses those qualities which characterize the narrator and critic, whose power lies in the field of the esthetic, and whose assertions have a firm basis in an appreciation of the real and true.

Samuel Carter Hall was born at Waterford, Ireland, in 1800, at which time his father, Col. Robert Hall, with his regiment,

was quartered there. Shortly after his birth, the family returned to his native country, Devonshire. Young Hall was educated for the bar, but his taste being strongly literary, he did not practice law. In his twentieth year he published a book. In 1823 he commenced to report in Parliament for *The New Times*, and acquired distinction in that pursuit. In 1824 he married the estimable lady who has for more than half a century been his wife and help-meet in almost every conceivable sense of that term. Mrs. Hall is of Irish birth, having been born in Dublin; her mother was of Huguenot descent. At the age of sixteen, while residing in London, she became acquainted with Mr. Hall, and in due time the two were married. In 1825 Mr. Hall established a paper called *The Amulet*, and conducted it for several years with much success. In 1829 Mrs. Hall published her first work, "Sketches of Irish Character." In 1830 Mr. Hall became editor of the *New Monthly Magazine*, succeeding the poet Campbell. After some years he withdrew, and was succeeded in the place by Theodore Hook. During this time Mrs. Hall published her child's story, "Chronicles of the School-Room," and her first novel, "The Buccaneers," following this by "Tales of Woman's Trials," "The Outlaw," "Uncle Horace," and then what is considered her most successful work, "Lights and Shadows of Irish Life." In 1839 she published her "Marion; or, The Young Maid's Fortune," which was translated into the German, Dutch, and French languages.

It was in 1839 that Mr. Hall conceived the idea of establishing a magazine devoted entirely to esthetic literature, and so launched *The Art Union*, which, under the somewhat modified title of the *Art Journal* he has continued uninterruptedly to conduct until the present day. In this undertaking he created his constituency, there being at the start no public taste for art literature, and for a few years there was little encouragement accorded by the press to his enterprise. Mr. Hall had much to do, of course, with encouraging artists, and had the pleasure of marking the growth of public interest in high art. Changes have taken place in the proprietorship of the *Art Journal* in the course of years, but the main features and original conception are still preserved.

MRS. HALL.

Not long subsequent to her "Marion," Mrs. Hall wrote the stories of the "Irish

Peasantry," and shortly afterward, in conjunction with her husband, published "Ireland, its Scenery, etc.," which gives a better description of the Irish people than any other we know. In 1845 Mrs. Hall wrote another story, entitled "The White Boy," and later, "Can Wrong be Right?" In 1857, "A Woman's Story;" in 1859, "The Book of the Thames," which has passed through various editions, appeared as their joint productions. Among Mrs. Hall's further contributions to general literature, we have "Mid-Summer Eve," "Irish Fairy-Tales," and "Pilgrimages to English Shrines." Another joint production of the husband and wife is "The Book of South Wales." Three or four other books prepared by Mr. Hall deserve mention: "The Royal Gallery of Art," "The Book of Gems," "The Book of Irish Ballads," "Baronial Halls of England," all of which were famous books in their day, and are yet highly esteemed by the lovers of fine art. Still another admirable contribution to general literature, and the production of the joint pen of husband and wife, is "The Book of Memories of Great Men and Women of the Age, from Personal Acquaintance." This was published in 1871, and a revised edition in 1877. It embraces portraits of the celebrated men and artists of the century who have passed away, but were well-known to the authors. Although advancing in life, Mr. and Mrs. Hall still maintain a vigorous facility in authorship. Mr. Hall by his "Trial of Sir Jasper," and Mrs. Hall by her "Boons and Blessings," have shown the enthusiasm of advocates in a good cause; so, too, Mrs. Hall's "Prince of the Fair Family," and "The Fight of Faith," have indicated that although Time has sprinkled snow in her once bright hair, he has by no means cramped her literary energy. Mr. Hall is now engaged on a work which will be likely to secure a wide interest, entitled "Recollections of a Long Life." American publishers have received contributions from Mr. Hall from time to time, so that our public can not be said to be altogether unconversant with his style and quality.

Two marks of royal favor have been conferred upon Mrs. Hall—the first, a grant of a hundred pounds per year, during her life; the second, the gift of a fine portrait of Her Majesty, and also earlier portraits of the Queen and of the Prince Consort, accompanied by an autographic letter. Of the Crystal Palace Art Union Mr. Hall was one of the founders, and has long been one of its leading managers. Other institutions exerting a public benefit have also received his advice and assistance.

It is the lot of few couples to live more than fifty-three years in happy, sympathetic wedlock as have these eminent persons, and their physical vigor promises to add many years more to their long companionship.

WITHOUT A SHADOW.

ONE Peter Schlemihl, years ago,
'Tis said, no shadow ever cast,
Though sunshine beamed with brightest glow,
And all the world looked on aghast.

And it no mercy to him showed—
For ages this has been the way,
To add unto the heaviest load—
And he at once became its prey:

Until, pursued by boys and men,
The earth to him looked like a grave;
Rather than meet the mob again,
He hid his life in Thebais' cave.

Like him how many pass along,
Full conscious that the world condemn,
Since from the ordinary throng
Some natural trait hath singled them.

Oft 'tis a gift, to most denied,
That makes this curious life completer,
Yet must they stem the oppressing tide;
Though they are innocent as Peter.

MARIE S. LADD.

THE ARROW AND THE SONG.

I SHOT an arrow in the air;
It fell to earth—I knew not where;
For so swiftly it flew, the sight
Could not follow, in its flight.
I breathed a song into the air;
It fell to earth—I knew not where;
For who has sight so keen and strong
That it can follow the flight of song;
Long, long afterward, in an oak,
I found the arrow, still unbroke;
And the song, from beginning to end,
I found again in the heart of a friend.

LONGFELLOW.

LIGHT IN DARK PLACES.

"This mournful truth is everywhere confessed,
Slow rises worth by poverty depressed."—SAMUEL JOHNSON.

CHAPTER XVI.

NORTON REPORTS HIMSELF.

PARTING from the gentleman who had rendered him so kind a service, Norton ran home with Bumpy at his heels. Bursting into the room, he shouted:

"I'm all right, mother, and hungry as a bear, and so is Bumpy."

"I am very glad to see you come home in such spirits, my boy," replied Mrs. Camp. "You will find something in the pantry. Bring it out, and fetch a chair for Bumpy, and then tell me about the proceedings before the magistrate."

Norton went to the pantry and found that several good things had been reserved, and he spread them on the table, with a plate, knife and fork for his companion, and then the two boys sat down and soon were in "the midst of things."

"How is it you are so hungry, Norton? Didn't you have enough for a breakfast of all that I sent and took to you?"

"Well, mother, there was enough for me; but you know, mother, that 'mong such a lot of poor fellows who were locked in with me there were some who were just half starved; and when I came to eat my breakfast this morning, I couldn't stand the way they looked at the things I had, and as I didn't feel hungry scarcely any, I gave all to them. But by the time I got into the court-room I was beginning to feel empty about the waistband. But, mother, the way Mr. Stanley fixed them—judge, old Jebson, and all—you just ought to have seen. He's the best lawyer I ever saw. Isn't he, Bumpy?"

"Yer can bet on't," replied Bumpy, with his mouth full.

Norton then went on to relate the incidents of the examination, in the course of which Bumpy interrupted him now and then to correct or add something; and when he had mentioned the part taken by Mr. Stanley in showing the difference between the boys' heads, Mrs. Camp remarked:

"Why, he brought in Phrenology! You remember, Nortie, how papa used to talk about heads, don't you?"

"Yes, mother, because he often talked about your head and mine being alike in something, and mine being like his in something else, I didn't understand exactly what. Oh, yes, I remember papa once said that I would be more like you in learning how to do things, to work with tools, and might make a good carpenter or cabinet-maker if I grew up strong and well."

"What the lawyer man got off 'bout yer head and Tim's 'pears ter've finished the job fur yer," broke in Bumpy. "And it fotched everybody up. Yer'd oughter seen the people look when the jedge wuz a feelin' uv yer head and cross-eye's."

"Yes, I think the judge knew something about it or he wouldn't have let Mr. Stanley talk about it so much. Don't you, mother?"

"It is very likely, Norton; for educated people generally nowadays have some acquaintance with the principles of Phrenology, or with the way in which the shape of the head shows one's disposition."

"But, mother, why don't they use it in the courts and trials and everywhere? Wouldn't it save a good deal of trouble?"

"Yes, my son; if Phrenology were properly applied in the every-day affairs of life it would be a great help in saving time, money, and trouble. But the world has not advanced enough; people have not become sufficiently free from the influence of old notions and old practices to admit it into general use."

"'Pears to me," said Bumpy, or Larry, if we would give him a respectable cognomen, "that this ere individible would feel kind o' scary ter have people a-feelin' uv his cokernut and a-tellin' all about wot he'd do ef he'd a chance."

"That's the kind of feeling which leads

people to say that it's not true. Isn't it, mother?" said Norton.

"Many people," replied Mrs. Camp, "would not care to have their real characters known, and so they oppose a system which judges one's disposition from the head. If storekeepers knew enough about it to examine the heads and general appearance of the boys who came to ask for situations, they wouldn't take thieves and deceitful rogues into their stores. But this matter, my boys, has to do with many things above your knowledge and comprehension now; and, if you have finished your meal, you should be thinking of your regular duties."

"Tha's so," said Bumpy; "and I'll be off. Guess mom's a-washin' ter-day, an's had ter guv the baby ter the nigger woman up-stairs. An' if this individible aint jest hum wen she comes back he'll ketch blazes."

Snatching his dilapidated cap, Bumpy made off, and Norton soon followed.

Thinking that it would be proper to inform Sadie of his escape from confinement, the affectionate brother on his way stopped at the bindery and solicited a two-minute interview with "my sister," which the foreman granted with a grumble, saying: "Make quick work of it, bub, as it's against the rules for the gals to have company in work hours."

Sadie was, of course, glad to see him, and listened eagerly to the hurried account of his night in the station-house and of the examination that morning.

"What a dear, good man Mr. Stanley is!" she exclaimed. "You'll be forever obliged to him; won't you, Nortie?"

"I guess so," said the boy; "but he isn't the kind of man who likes to have people obliged to him, for when I thanked him for having taken so much trouble on my account, he said: 'That's nothing, my son; I couldn't begin to pay you for all the good your father did me in one way or other.' I wonder what he meant by that?"

"I'm sure I don't know," replied the young girl. "Perhaps mother can tell us something about him and father. But, Nortie, it's time you went. Briggs is looking this way, and sour enough."

Norton, on this hint, immediately sped out of the shop and went on his customary round.

CHAPTER XVII.

IN WHICH MR. STANLEY IS FURTHER INTRODUCED.

MRS. CAMP'S promptitude in delivering the work finished with the aid of Betty, gave "satisfaction," and secured further jobs from the same house; but her expectations were not fully met, as during the remainder of the summer there were one or two days in each week when she had no outside engagements. Her "off-days," as she termed these, were filled up, however; for there were always in her mind plans or settled convictions relating to things which would contribute to the welfare of her family or of her neighbors; and the practical carrying out of any of these, as leisure permitted, resulted in much comfort to her.

Work is the grand solace of the distressed heart, especially work which has in view the benefit of others. If the thousands who go about listlessly bemoaning lost time, lost opportunities, lack of employment, poverty, misfortune, would set earnestly to work at whatever their hands find to do, thinking little of the pecuniary recompense, society would be relieved of a vast load of misery.

Mr. Stanley called two or three times on the widowed mother, and conversed on matters which concerned chiefly his soldier life. Of course his association with her late husband soon gave him the place of a friend in Mrs. Camp's esteem; but her refined sensitiveness and dislike to incur obligations rendered her almost distrustful of herself in allowing a friendly intimacy with a gentleman whom she had known in person so short a time. Stanley's hearty earnestness and trustful manner had won her good opinion in the outset, yet she deemed it wise to maintain a prudent reserve for the sake of her children. Stanley, on his side, felt more and more drawn toward the lady, impressed by her lofty character and rarely-endowed mind. He remembered a remark, half jocose, which his friend the

lieutenant had dropped one day in the course of talk on the women of society. He had reviewed in a cynical, bitter tone the superficial, vapid manners which too much prevail in fashionable circles, and inveighed against the insanity which led men to bow before shrines whose beauty was made up principally of lace and tinsel, while of mental endowments they possessed little of practical significance. Lieutenant Camp listened to this vehement indictment with a half-amused expression playing on his face, and finally broke in with—

"They are a good deal of what you say, sergeant, but, should you see Mrs. Camp, you would forgive them for her sake." The more he saw of the lady the more he was persuaded of her great worth, of the no-

MR. STANLEY.

bility and beauty of her womanhood, and he found himself now and then soliloquizing—"Camp was right; that woman, indeed, balances the caprices and frivolities of the others." He had not lived more than forty years without experiencing some phases of the tender passion; and people who knew him wondered how it was that so companionable a man had not settled down in the domestic relation years before, instead of lingering on the hospitality of this or that housekeeper, whose particular consideration in entertaining him was a mercenary one. There was in his memory one warm niche where rested sundry sweet recollections of a pair of sapphire eyes with which his own deep brown ones once held tryst. He might have loved their owner—he certainly had reached the point of warm esteem, when a bold and dashing wooer with the glittering prestige of wealth—Stanley was only a clerk then—stepped in and bore the lady to a western home. She was poor and ambitious, the daughter of a widow invalided and dependent largely upon a son whose wife regarded with a jealous eye every contribution made for the mother's comfort. The young lady accepted the proffer of wealth for her mother's sake, Stanley was sure, and he could not blame her; yet the loss of her society gave him much more pain than he would have expected had it been previously suggested to him. He did not turn to the society of other ladies for solace, but gave closer attention to business, and his heart's loss proved his pocket's gain, as his assiduity won promotion and excellent remuneration.

Another reason for his bachelorhood, and one applicable to the period when lack of income could not be urged as a practical objection, was his business relation then; he traveled a great deal for the firm, being absent from the city six months or more in the course of the year. Stanley insisted that a husband's place was at home; that he should not follow a vocation which required him to leave it frequently; that the claims of wife and children are imperative, and of the highest character known to human life; and the man who, by frequent and long absences from home, compelled his wife and little ones to look to others for protection and counsel was unworthy of being a husband and father. Furthermore, he realized the peril in which one lived who was traveling from place to place at different seasons, and he deemed the anxiety of a wife so related a direct imposition of cruelty. This may be regarded as an extreme view by most readers, but Stanley's generous sympathy for woman, particularly in motherhood, added intensity and consistency to his convictions.

The war interfered greatly with his business, as its transactions had been largely Southern, and he himself felt keenly the bitterness of the strife since he had traveled throughout the Southern States and had

formed many friendships there. The dullness of trade at length determined the firm to suspend, at least temporarily. Then Stanley's patriotic sympathy led to his volunteering in defense of his country's flag. How he met Lieutenant Camp has been related. That gentleman's earnestness and culture drew Stanley at once toward him, and a close intimacy grew up between them, to be severed so suddenly by the horrid shaft of battle.

Mustered out of service, he returned to Boston, his former abode, and soon afterward learning that his old firm had recommenced business operations, but in New York, he wrote to the senior partner, offering his services. A few days later there came an answer, requesting him to repair at once to the American metropolis. He did so, was warmly received, and in a day or two occupied his old position. Three years later one of the partners proposed to withdraw from the concern, and Stanley was invited to take his place. A married sister, who had long resided in New York, invited Stanley to live with her family, and the homeless man gladly accepted the opportunity. He now was no longer required to travel, and for the first time began to experience some of the enjoyments and peace of home life. A small circle of friends, his sister's family, a little of philanthropic work, and an evening or two at the Mercantile Library, filled out his leisure from week to week. Perhaps the routine of it was becoming a little monotonous; at any rate he welcomed the new experiences which the discovery of the Camps brought, and found himself becoming more and more interested in them as the acquaintance continued.

CHAPTER XVIII.

A DRESS CONFERENCE.

SUMMER had almost passed, the frequent recurrence of cool days reminding the community that it would be wise to make provision betimes against autumnal cold and its sickness-producing allies—easterly winds and rains. Mrs. Camp's liberal knowledge of hygiene led her to use such means as she could command to feed and clothe her children in accordance with the weather. She deemed it the extreme of folly for poor people to attempt to imitate the fashions of society, and pitied the women and girls of her neighborhood who spent the wages procured by the hardest labor for ribbons and gew-gaws and shoddy stuffs that they might appear somewhat like the garish pictures in fashion plates. She aimed to dress neatly and gracefully, but at no sacrifice of comfort and health. The latter she regarded as of a value so far exceeding the observance of fashion that its demands were to be respected always without any heed to fashion when that tyrannical goddess came in conflict with health.

Sadie, like all vivacious, robust girls, felt drawn toward rich dress and brilliant decoration, and often sighed when a lady of upper-tendom passed her on the street with silken skirts *en train* and bright flowers waving from a delicate frame of straw or felt called a bonnet, because she was denied the ability to equip herself in beautiful garments. The course which she was wont to take in her daily walk to and from the shop was not often selected by ladies of fashion, so that when one appeared in the neighborhood her attire contrasted sharply with the poor garments of its habitués. Sadie was on her way homeward for dinner one day that summer when she passed a lady of *ton*, who had just alighted from a handsome carriage and was entering the hallway of a tenement, perhaps intent upon some errand of benevolence or in search of some woman who had advertised for a place for household service. The flash of the lady's bespangled and fluted robe fascinated the young girl's eye, and she paused a moment in her rapid walk to gaze on its display of manifold trimming, and then pursued her way, absorbed in thought, many wild fancies coursing through her longing head. At the dinner-table she could not forbear alluding to the incident, her frank expression disclosing the regret cherished deep within on account of her inability to gratify the esthetic aspirations of her nature.

"How happy such people must be, mother dear," said she, "when they can dress in

such materials and styles as they like, and always appear so elegantly!"

"My darling, you see only through gilded glasses when considering such people. Your experiences of life have not yet included an intimate contact with the votaries of fashion. Your fresh, generous heart can scarcely conceive of wealth and mental culture as being hampered and controlled by selfishness, jealousy, and the petty exactions of convention. You look at people favored by fortune, and envy their ability to do noble and great things for others, little realizing the fact that the acquisition of wealth and the gratification of self, which is usually coincident with it, tend to suppress true feelings of sympathy and benevolence."

"Why, mother, it is the duty of the rich to help the poor."

"Yes, my child, but people do not always respect the call of duty. The old proverb, 'The more we have the more we want,' applies so directly to those who live in the midst of profusion that the pure and candid soul is astonished by the amount of absolute wretchedness which exists among the wealthy, simply on account of unsatisfied desires. The great poet says:

> "'"'Tis better to be lowly born,
> And range with humble livers in content,
> Than to be perked up in a glistering grief
> And wear a golden sorrow.'

And if you could have the opportunity to study the home life of the finely-dressed women whom you meet, you would find many a 'glistering grief,' and look with far more content upon our humble lot."

"Oh, my own mamma, I wouldn't exchange my home for the proudest palace on earth, unless you were with me. I couldn't be happy, except you and Dell and Nortie partook of my good fortune. But, mother, don't you like to see and to wear beautiful garments?"

"Certainly, my love, but I would have the qualities of harmony, propriety, and fitness enter into their selections and make-up. Every one should dress in accordance with her station; should consider the law of correspondence as regards complexion, size, avocation, etc. It is right to endeavor within reasonable limits to make ourselves look as well as possible, but we should not sacrifice valuable time in questionable and injurious methods of decoration, like painting and powdering the face, wearing medicated gloves to whiten the hands, and in contriving startling and extravagant effects in dress for the head or body."

SADIE MEETS A LADY OF FASHION.

"I'm going to wear patent-leather shoes when I can afford 'em," said Norton, "for they're handsome, and I've noticed that men who wear 'em aren't much troubled by the boot-blacks. Jim Tuff blacks boots,

and he told me one day that he'd just like to burn up all the patent leather ever made, 'cause the fellows who wore it felt themselves so much above the boot-blacks. Now I think that patent leather must be very convenient, 'cause it saves time. One who wears it doesn't have to shine his shoes every morning and doesn't have boys running after him and getting in his way with, 'Black yer boots? shine 'em up?—only five cents.' I wonder that more people don't wear 'em."

"I think they're real pretty, and you'd look so nice in a pair, Nortie," put in Dell, who was much given to championing her brother and occasioned much fun to mother and sister by her arch earnestness in it.

"When Nortie can afford to wear patent-leather boots or shoes, mamma will offer no objections. Such dressing for the feet needs nice dressing for the body to harmonize with it, just as a handsome bonnet requires handsome garments. Here it is where many people who can not afford to dress well show their want of taste and judgment; they put on an expensive sacque or mantle over a cheap and sleazy dress, or expect an elaborately-trimmed bonnet to compensate for the scantiness of the remainder of their costume, not realizing that the strong contrast of quality thus presented by their attire renders them objects of ridicule with those they would imitate."

"I heard you say, mother, once, if I aint mistaken—"

"You mean, my boy, if you mistake not."

"Oh, yes, mother, if I mistake not, that you like to see a good hat on people, even if the rest of their clothing was shabby."

"Yes, I probably said that. I meant that a neat, proper hat or bonnet relieved in a considerable degree poor or much-worn garments. You know that shoes may be ill-fitting and be patched, yet when kept clean and bright they impart an air of gentility to a threadbare coat. Neatness, my children, will cover many defects of face and dress which would otherwise be rendered conspicuous. One advantage," continued the lady, "which we poor people possess over the rich, and which is not sufficiently considered, is that we can pay a close regard to comfort in our selection of things to wear, and we can use good sense in rejecting the follies of fashion, and wearing only what is becoming, without being criticised by our neighbors. When you become a lady of society, my Sadie, you will find yourself in a kind of slavery; being expected to do as other ladies do and to sacrifice your own judgment in very many ways, and often in matters of vital importance, especially if you be a wife and mother."

"I'm sure, mother dear, if I could not do what I thought to be proper and right, I would not care to be rich, for under such restraints I couldn't be happy."

"But you might be rich and not a 'society lady,' so called, and act in accordance with your views of duty; and in using the great opportunities which are in the way of wealth to help others and benefit society, you would heighten your enjoyment of life."

"Quarter to one, and I must go, mother. I wanted to speak about something else, but I've quite forgotten it; perhaps I'll think of it by tea-time."

Sadie put on sacque and hat and tripped down-stairs, and the family conference was dissolved.

H. S. DRAYTON.

(*To be continued.*)

THE TWO HEAPS. — The Rev. John Newton once said: "I see in this world two heaps—one of human happiness and one of misery. Now, if I can take but the smallest bit from the second heap and add to the first, I carry a point. If, as I go home, a child has dropped a half-penny, and if, by giving it another, I can wipe away its tears, I feel that I have done something. I should be glad, indeed, to do great things, but I will not neglect such little ones as this." Such little offices lie within the sphere of every one.

Literature, Mental Science, and Education.

True philosophy is a revelation of the Divine will manifested in creation; it harmonizes with all truth, and can not with impunity be neglected.

SMOLLETT AS A NOVELIST.

THANK Heaven! the foundation of every production in literature must be the same. It is truth. Accuracy in the historian, and careful delineation in the novelist; exactness in the poet, and precision in the philosopher—to these the appeal of the critic must be made. And when this latter personage loses himself in the intricate wanderings of an author's fancy, or finds himself bewildered by the capricious enigmas of his thought, he finds in Truth a compass by which to take his bearings. Would it not be well if many authors would supply themselves with a similar instrument, and referring to it occasionally, understand whither they are drifting? Unfortunately, Truth is, to a great extent, a negative virtue merely. The plain structure, solid though it be, is uninviting. The reader loves a varied picture. Sweet dreams of happier days, and the stirring songs which courage sings of war, come like a breath of spring to the wearied fancy. The historian without imagination and a spirit of true philosophy, is unworthy the name, and the novelist, without a true conception of the poetic, speedily sinks to his own place.

In the immense demand for fictitious writing at this time, even such an important fact is lost to view; and thousands of people, young and old fitted neither by nature nor education, are swarming into the field like paupers to a free feast. By pampering to some popular passion, their effusions raise a clamor of coarse approval, but ere long their sentimental dreams of love and duty must melt away like morning frosts. This is nothing new. People of all degrees of capacity have always been writing. Some have already stumbled into stagnant pools of oblivion; others have come down to us with a greater or less degree of popularity. Among this latter class, Tobias Smollett, less popular to-day than in the days of our grandfathers, is still accorded some degree of merit. He was a sailor in early life, then a physician. He was somewhat acquainted with life on the continent, and knew the ill-usage of publishers and magnates of the theatre. All this experience was valuable, for from it he has derived his chief excellencies.

Our attention shall be directed mainly to the contemplation of "Peregrine Pickle," which will afford us a just opportunity of judging the character of Smollett's work. In this tale, all unity of plan is disregarded. We are snatched from scenes already familiar and from companions whom we ought to have loved, with a regard for the affections decidedly Oriental. We are whirled from London through the continent; back again, and round again. In emulation of the biographical brotherhood, we begin with the ancestral line. We are called to the marriage of Pickle's parents, and our acquaintance does not cease till we see the hero himself safe in the folds of the same holy alliance. We are with him in a youth of wantonness; we go with him down to the despair of prison life, and rejoice when fortune smiles again. We are bewildered by a multitude of characters, evidently thus lavishly thrown in to show the fertility of Smollett's genius—an end which some critic has been prevailed upon to believe is accomplished thereby. It would rather indicate a paucity of judgment and lack of concentrative power. The great merit of the work is the delineation of character in the person of his hero. This wonderful

youth, completely disgusting in himself, perhaps, well illustrates the course of a spirited boy, cast off by his parents and adopted by a mad and doting uncle of unlimited fortune. Pickle was a prodigy. Developing wondrous beauty of figure and boldness of address, keenness of intellect and pungency of wit, he was petted and courted until his insolence and haughtiness became revolting and his conceit such as to believe that no woman could withstand his charms, when he deserted the girl to whom he had plighted his love because he believed she was no longer his equal. Intoxicated by the attention paid his fortune and wit, he leaped into the most unrestrained prodigality, which terminated only when, with squandered fortunes, and deserted of friends, he was lodged in prison until the death of his father, when he was again elevated to wealth, married the girl whose honor he had attempted, and settled down to steady life, it is to be supposed, a wiser man. This is spread through two volumes, which, if condensed to the compass of the "Vicar of Wakefield," might have been almost as popular; but filled as it is by records which, for their brilliancy, might have been copied from the pages of "Euclid," it will always be passed as "no favorite of ours." The interminable memoirs of "A Lady of Quality," and the everlasting tale of the clergyman in the "Fleet," both inserted in emulation of Cervantes, have no more connection with the purpose of the narrative than Sancho's proverbs with the chivalry of his master. In the early part of the story the reader is led on by the agreeable humor of the sea characters, Trunnion and Hatchway, whom somebody has called "inimitable." He must be antagonistic, indeed, who will admit that Smollett is not frequently decidedly funny. Yet there is none of that delicate levity, half earnest, half ludicrous, which abounds in the pages of Goldsmith.

Smollett had little of that poetic imagination which characterizes Bulwer so remarkably; neither has he the art of presenting his reflections boiled down to those delicious kernels of truth, to which the Greeks of Hippocrates' day gave the name of aphorisms, and which make up a form of philosophy peculiar to the novelist. Nor has he the faculty of fascinating the reader by beautiful comparisons and flights of fancy—qualities of style which give to Bulwer a peculiar character among novelists. Smollett seldom attempts such boldness—perhaps because he is conscious of his lack of ability, and perhaps because his attention was never directed to its advantages. Whenever he chances to approach it, he carefully feels his way, keeping near shore, never striking boldly out and bringing back fresh discoveries to please and instruct. Smollett is evidently master of his passions; and when he speaks of love, he talks moderately. "Love (when he reigns in full empire) is altogether irresistible, surmounts every difficulty, and swallows up all other qualifications." Not so Bulwer; he is all on fire. Glaucus and Ione have met; have loved. They are gazing upon the dark mountain of Vesuvius. "A sudden and unaccountable gloom came over them as they gazed, and in that sympathy which love had already taught them, and which bade them in the slightest shadows of evil to turn for refuge to each other, their gaze at the same moment left the mountain and, full of unimaginable tenderness, met. What need had they of words to say they loved?" Smollett is not fond of comparisons. It is not often that he loses control of himself as in the following: "Like a stream which, being dammed, accumulates more force, and bursting over its bounds rushes down with double impetuosity." Notice in contrast this forceful comparison from Bulwer. Arbaces is walking in the damp cellars beneath his luxurious mansion. "These rude abodes that furnish the luxuries of the halls above are like the laborers of the world—we despise their ruggedness, yet they feed the very pride which disdains them." Seldom is Smollett so passionate as this: "Oh! baleful envy! thou self-tormenting fiend! how dost thou predominate in all assemblies, from the grand gala of a court to the meeting of simple peasants at their harvest-home." Sometimes he makes a sharp statement: "A man, conscious of his own indiscretion, is implacably offended at the

rectitude of his companion's conduct, which he considers as an insult upon his feelings never to be forgiven, even though he have not tasted the bitterness of reproof, which no sinner can commodiously digest."

Perhaps Smollett's weakest point is his deficiency in taste. If he intended Pickle as a model youth, it would be nothing strange; but we will not do him the injustice to suppose that he did. While in many authors prudish notions of propriety give to their characters an appearance of artificial morality, such blemishes must not be credited to Smollett. On the contrary, he seems to take pleasure in coarse references; and, like the irrepressible train-boy, is continually thrusting his favorite wares upon you with a leer of satisfaction. His hero picks up a common street-walker, dresses her up *à la mode*, gives her a few superficial lessons in etiquette, and introduces her to society as a niece of his friend Hatchway, in which character she passes for a lady of birth and culture until she unfortunately betrays herself and Pickle by unguarded behavior. By this episode our author gets off a sarcastic hit at society, and makes plain that "all persons whatsoever, capable of maintaining a certain appearance, will always find admission into what is called the best society, and be rated, in point of character, according to their own valuation, without subjecting their pretensions to the smallest doubt or examination." His attempts toward the pathetic are almost failures. When Lord W—m, the husband of the "Lady of Quality," dies, the loving wife is told by a friend that her "dear devoted" is dead—a fact of which she learns for the first time, though occupying the same bed with his departed lordship. She gets up; steps over his head as if afraid to wake him, (how sublime!) throws up the window and stares at the sun!

Smollett is not forgotten because he could read human nature and make men laugh. He has wit and sarcasm; yet, with but few exceptions, his characters seem unreal. We do not feel with them. We are passive. They are like wooden puppets dancing upon a distant stage. They are always flitting about; but whether they be few or many, whether they look like men or women, we care not. We know they are all of wood, inanimate, lifeless. GRANVILLE M. TEMPLETON.

BRAIN AND MIND.

CHAPTER I.

GENERAL PRINCIPLES.

PHRENOLOGY—composed of two Greek words, φρην, mind, and λογος, discourse—is a system of mental philosophy founded upon the physiology of the brain. It assumes as its fundamental principle that the brain is the organ of mind just as the eye is the organ of vision, the stomach of digestion, or the heart of circulation.

It was long a disputed point among physiologists what function the brain performed in the animal economy. Hippocrates and Astruc thought the brain was a sponge; Aristotle considered it a bloodless mass which tempered the heat of the heart; Praxagoras, Plistonicus, Philotinus, and others regarded it as a mere excrescence of the spinal marrow; Misticelli called it an inorganic mass; Malpighi thought it was a collection of confused intestines; Sabatier and Boyer considered it a secretory organ; Galen and many others imagined that it secreted vital spirits, and distributed them through the arteries of the body; and Bichat thought it an envelope to protect the parts beneath. It is now generally conceded by the leading physiologists that the brain is the organ of mind. As, however, there

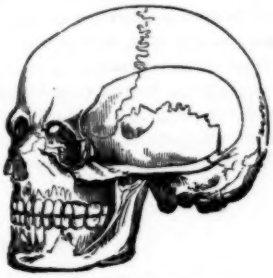
are those who are disposed to dispute the correctness of this opinion, it may be well for us to bring forward some of the proofs by which the truth of this proposition is established.

1. ***Size and Intelligence.***—A low degree of mental power invariably accompanies a marked deficiency of brain. In the lowest class of idiots the horizontal circumference of the head, above the ears, measures from 12 to 13 inches; in a full-sized head the circumference is 22 inches. In such idiots the distance from the root of the nose, measured over the top of the head to the occipital spine, is but 8 or 9 inches; in a full-sized head it is 14. The heads of barbarous or savage races are smaller than those of the civilized; the negro skull has a brain capacity averaging 82

Low Type. Idiot Skull.

cubic inches; the higher tribes of American Indians, according to Prof. S. G. Morton, like the Seminoles and Oneidans, have a brain-measurement of about 90 inches; while the measurement of the English and German encephalon internally is placed by the best authorities at over 100 cubic inches. In a table derived from 405 autopsies of white and negro brains, recorded by Prof. Austin Flint, of New York, the average weight of the white brain is given at 52 ounces, and that of the negro at 46.9; these negro specimens, however, were of men who had been associated with whites almost from birth. Whenever the head does not exceed 13 or 14 inches in horizontal circumference, idiocy is the invariable consequence.

2. ***Brain Development and Mentality.***—Throughout the whole animal kingdom the brain is found to be larger and more complicated in proportion to the strength and number of the mental faculties manifested. "We find," says Prof. Graves, of Dublin, "that exactly in proportion as the encephalic portion of the nervous system is developed in the vertebrated animals, we can trace the appearance of new faculties, which, few and obscure in the lower species, become, as we ascend, more numerous and more distinct until we arrive at man, in whom the brain attains a degree of preëminence sufficient to place him far above all other species of mammalia . . . . But man does not



Well Developed Skull.

only differ from other animals in the configuration of his brain and the capacity of his mind, but also exhibits the singular fact of a great difference in these respects between individuals of the same species: it being an obvious fact that different men exhibit as much disparity in their intellectual powers as if they were animals of a different genus. In all such cases (where the difference between the intellectual powers is extreme), there also we invariably find a striking difference between the form and size of their skulls, the most highly-gifted always presenting a greater relative proportion of brain." On this point modern physiologists are generally

agreed. Prof. Flint, in his late work on Physiology, cautiously writes: "It may be stated as a general proposition that, in the different races of men, the cerebrum is developed in proportion to their intellectual power; and in different individuals of the same race, the same general rule obtains." Cromwell, Cuvier, Abercrombie, Dupuytren, Chalmers, Napoleon Bonaparte, Daniel Webster, Spurzheim, and other men of conspicuous eminence possessed heads much larger than the average.

3. ***Effect of Morbid Conditions.*** —In disease of or injury to the brain the mind is always affected. Dr. Stokes, in his lectures on the practice of medicine, relates a case in which a tumor was removed from the interior surface of a man's skull; whereupon the patient was immediately, and for the first time, attacked with loss of consciousness, and convulsions of the trunk and extremities. The surgeon, thinking that the removal of the pressure from the brain, to which it had gradually accommodated itself during the growth of the tumor, was the cause of these symptoms, made a gentle pressure on the exposed surface, and the convulsions immediately ceased and consciousness returned.

Another authority, Prof. Chapman, relates a case in which the brain was exposed by the loss of a portion of the skull. In this instance consciousness could be suspended at pleasure by merely pressing on the exposed surface with the finger, and restored by removing the pressure. Sir William C. Ellis reports, in his "Treatise on Insanity," that out of 221 cases of dissection, he found that 207 showed decided marks of brain disease; four of the remainder being congenital idiots must be excluded from the list, thus leaving only ten cases in which he could not detect organic disease of the brain; and of these ten, seven were recent cases, being only about a month ill.

4. ***In Swooning,*** the blood being rapidly withdrawn from the brain, consciousness is suspended.

4. ***Movement.*** — Where the brain has been exposed by the removal of a portion of the skull, it has been observed that it is agitated in proportion to the degree of mental excitement. A young man was brought to Sir Astley Cooper who had lost a portion of his skull just above the eyebrow. "On examining the head," Sir Astley says, "I distinctly saw the pulsation of the brain. It was regular and slow; but at this time he was agitated by some opposition to his wishes, and directly the blood was sent with increased force to the brain, and the pulsations became frequent and violent. If, therefore," he continues, "you omit to keep the mind free from agitation, your other means (in the treatment of injuries of the brain) will be unavailing."

Dr. Pierquin reports the case of a woman who had lost a large portion of her scalp, skull, and dura-mater. When in a dreamless sleep, her brain was motionless, and lay within the cranium. When agitated by dreams, her brain moved, and protruded outside the cranium. In vivid dreams the protrusion was considerable; and when she was perfectly awake, especially if engaged in active thought or sprightly conversation, it was still greater.

These are but a few in the vast multitude of cases which might be brought forward in support of the principle that the brain is the organ of mind.

THE BRAIN A CONGERIES OF ORGANS.

A second principle of Phrenology is, the brain is made up of as many individual organs as there are distinct mental faculties. This is a proposition

which is not admitted by all of those who readily concede that the brain is the organ of mind, yet it is supported by an array of proof fully as convincing as that. It is in point to remark here that the necessity of considering the brain a compound organ had presented itself to the minds of many earnest inquirers of ancient and mediæval times, from Aristotle down, in order to account for the great diversity of mental characteristics which they observed among men.

Aristotle, as has been stated in the Introduction, divided the brain into parts, and designated them as the seats respectively of common sense, imagination, judgment, reflection, and memory. This distribution was accepted or followed in the main by leading philosophers from Aristotle to the time of Dr. Gall's discoveries. Such authorities as Galen, Albert Magnus, Bernard Gordan, Huarte the Spaniard, Porta of Naples, Ludovico Dolce, Thomas Willis, a professor in Oxford University, are noteworthy. Of Prof. Willis a recent author, Dr. B. W. Richardson, says that it was "he who gave the world of science the first true light on the function of the different parts of the brain." A work on the "Anatomy of the Brain" was published by Willis in 1644, in which he sets forth his doctrine that the brain is a congeries of organs, and the seat of moral and intellectual action.

Fœderé, a zealous opponent of Phrenology, is compelled to admit, when speaking of a plurality of organs in the brain, that "this kind of reasoning has been employed by the greater number of anatomists, from the time of Galen down to our own day, and even by the great Haller, who experienced a necessity for assigning a function to each department of the brain."

Cuvier says, in his "Anatomie Comparée," vol. ii., that "certain parts of the brain in all classes of animals are large or small, according to certain qualities of the animal." Bonnetus asserts that "the brain is a very complicated organ, or, rather, an assemblage of different organs." Tissot also asserts that every perception has different fibers; while Van Swieten and Prochaska entertained the opinion that the internal senses occupy in the brain organs as distinct as the nerves of the external senses. But it was reserved for Dr. Gall to give a substantial basis to the theory that the brain is a compound organ, by discovering the respective places in it of different mental faculties. The weight of authority supplied by the authors we have named is great, but aside from them we think that the brain is demonstrated to be a compound organ by the following arguments:

1. ***Organ and Function Special.*** —Every distinct physical function has a special organ. Sight, hearing, taste, digestion, circulation, etc., has each its appropriate organ, which is capable of performing only its peculiar function. And whenever any organ has a compound function, it is found to be possessed of a complex nervous apparatus. The tongue, for instance, which exercises the function of taste, possesses also those of feeling and motion, and accordingly it has three sets of nerves corresponding with its triple function. From analogy, therefore, it is reasonable to suppose that such different mental operations as loving, hating, fearing, hoping, etc., should have different cerebral organs.

2. ***Mental Faculties Successively Indicated.***—The different mental faculties do not all appear at the earliest period of the individual's existence. Almost the only faculty manifested

by the new-born babe is the desire for food, but soon it comes to observe things which exist around it, and to love, dislike, and manifest anger and stubbornness; while its capacity to reason, and its sense of duty and responsibility, do not appear until a much later period. Were the brain a single organ it would manifest at any time one faculty as readily as another.

3. ***Genius or Talent Partial.***—The fact that genius is almost always partial is plainly contradictory to the organic unity of the brain. For, if a mental faculty be only a particular mode of mental manifestation, and if the whole brain be concerned in every operation of the mind, there is no reason why an individual who possesses a remarkable talent for mathematics should not be equally gifted in music, painting, poetry, or in any other special talent. It is to be observed that remarkable talents often appear at such an early age that the old metaphysical theory that they are "the result of acquired habits, aided by favorable circumstances" is entirely precluded. Allan Cunningham, in his "British Painters," says of Richard Wilson: "His love of art appeared early. How this came upon him in a place where there were no paintings to awaken his emotions we are not informed, but a slight cause will arouse a strong natural spirit." Of Benjamin West he says that at the age of seven he drew an accurate likeness of his little sister with red and black ink, and this is the more remarkable as "there were neither professors, paintings, nor prints among the primitives of Pennsylvania." Pope says of himself that he "lisped in numbers, for the numbers came." And George Bidder astonished the world with his mathematical calculations at the age of twelve. Within a year past Mr. Smiles' interesting biography of Thos. Edwards, the Scottish naturalist, has been published, which furnishes additional testimony, if any be needed, to the variations of mental organization and partial genius. Mr. Smiles, in striking terms, shows how the innate qualities of this eminent subject displayed themselves in childhood: "When only four months old he leaped from his mother's arms to catch some flies buzzing in the window;" and when a boy he persisted in collecting and studying the habits of beetles, frogs, crabs, lizards, rats, mice, etc., in spite of threats and whippings.

4. ***Idiocy and Insanity Special.***—Partial idiocy and partial insanity are explicable only on the supposition that the mind operates through a plurality of organs. There are individuals who possess a remarkable talent for music, drawing, rhyming, calculation, or mechanics, but who in all other respects are practically idiotic.

Fœderé, in speaking of the Alpine Cretins, says: "It is remarkable that, by an *inexplicable singularity*, some of these individuals, endowed with so weak minds, are born with a particular talent for copying paintings, for rhyming, or for music. I have known several who have taught themselves to play tolerably on the organ and harpsichord; others who understood, without ever having had a master, the repairing of watches and the construction of some pieces of mechanism." These powers, he says, could not be attributed to intellect, "for these individuals not only could not read the books which treated of the principles of mechanics, but were confounded if spoken to on the subject, and never improved themselves."

The reader is probably familiar with that remarkable American musical prodigy, "Blind Tom," who has been so ex-

tensively exhibited. This negro youth, although a wonder to all who hear his musical performances, is an imbecile in most other respects.

Were the brain a single organ, these phenomena could not occur; for whatever power it possessed it would be equally capable of manifesting that on every subject, and it would be just as unreasonable to suppose that such power could be exercised on music, drawing, mechanics, or mathematics, and be utterly deficient in every other respect, as to suppose that the eye which is capable of seeing a horse, a cow, a tree, or a house might be blind to every other object in nature.

In *monomania* and partial insanity, again, the phenomena of the mind indicate derangement in one or several faculties, while all the rest appear perfectly sound.

"Hospitals for the insane," says Pinel, "are never without some examples of mania marked by acts of extravagance, or even of fury, with a kind of judgment preserved in all its integrity, if we judge of it by the conversation; the lunatic gives the most just and precise answers to the questions of the curious; no incoherence of ideas is discernible; he reads and writes letters as if his understanding were perfectly sound; and yet, by a singular contrast, he tears in pieces his clothes and bed-covers, and always finds some plausible reason to justify his wandering and his fury. This sort of mania is so far from rare that the vulgar name of *folie raisonnante* has been given to it."

Sir George Mackenzie mentions the case of a man who was able to converse rationally on every subject but the moon. On hearing the moon mentioned he became greatly excited, as he believed himself secretary to the moon. Dr. Gall speaks of a lunatic who was confined in the hospital at Bicetre, who succeeded so well in persuading a magistrate who visited the asylum that he was the victim of the cupidity and cruelty of his relatives, that the magistrate thought seriously of examining into his case with a view to setting him at liberty. But as he was about taking his departure, promising to return shortly with good tidings, the madman remarked: "Your excellency will always be welcome except on Saturday; for on that day the Holy Virgin makes me a visit."

These cases of partial insanity, like those of partial idiocy, are utterly incompatible with the idea that the mind has but a single organic apparatus; but they are clearly and rationally explained on the supposition that the brain is composed of a number of organs. For then, in cases of partial idiocy, it is perfectly rational to suppose that the organs of those faculties which are strongly manifested are well-developed, while the other mental organs are in such a rudimentary condition as to be incapable of the proper manifestation of mind; and all cases of partial insanity are rationally explained by the theory that one or more mental organs are diseased, and thus give forth a perverted manifestation, while all the others are sound, and capable of performing their normal function. This, indeed, has been proved in a vast number of instances by actual demonstration.

5. ***Injuries*** to parts of the brain tend, in like manner, to confirm the notion of its compound character, as well as the correctness of the location of many of its organs. A boy in Washington was once struck on the head at the place where the organ of Tune is situated, and had a sliver of the skull driven into the brain matter at that part. He immediately began to mani-

fest a powerful disposition to whistle; he whistled constantly; would even whistle between his mouthfuls of food, but when the portion of bone which was driven into his brain was withdrawn, he whistled less and less, until the wound had healed, when his impulse to whistle was entirely removed.

A man received a blow upon the organ of Mirthfulness, and soon after exhibited such a disposition to make fun of everything he saw, that his friends had him confined as a lunatic. But on the application of treatment to reduce the inflammation of the injured part of the brain, he was entirely cured in a few hours of his disposition to laugh. A farmer in Massachusetts, while yoking oxen, received a blow from the horn of one of them on the back part of his head. Though formerly an affectionate husband and a kind neighbor, he soon came to treat his wife very harshly, and would order his former friends and neighbors out of the house when they came to visit him, while with strangers he was courteous and sociable. A *post-mortem* examination revealed the fact that the organ of Friendship was the portion of brain which had received the blow from the ox, and it and adjoining organs were extensively diseased.

SIZE AND MENTAL POWER.

One of the arguments which we have brought forward in proof that the brain is the organ of mind is that a deficiency of brain is always attended by a low degree of mental power, and that men of commanding mental capacity have invariably had heads of unusual size. Now, what is true of the brain as a whole, is true also of its individual organs. The greater the size of an organ, the greater will be its power of manifesting its faculty; and, on the other hand, the smaller an organ, the weaker will be the manifestation of its faculty. In other words, the size of an organ is the measure of its power. The principle that size is the measure of power holds true universally wherever objects are compared which possess the same qualities. A large bone or muscle possesses greater strength than a small one; and the function of respiration will be vigorous or feeble in proportion to the size of its organ, the lungs. Some, indeed, have asserted that this law does not hold true of the brain, but only of those organs whose exercise is connected with mechanical force, as in muscular contraction. The perfection of vision, it is said, does not bear the least proportion to the size of the eye, either when considered with respect to different species of animals, or with respect to different animals of the same species. But though the power of vision is not measured by the size of the eye, it is incontrovertible that it is measured by the size of the optic nerve, which is in reality the medium of vision. According to Desmoulins, in the screech-owl, whose sight is defective, the parts from which the optic nerves arise are not more than one-twentieth part of the brain; while in the eagle, which is proverbial for keenness of vision, the same parts are about one-third of the brain. The optic nerves in these two classes of animals are in the same proportion. This same author says that in order to increase the surface of the retina, which is the expansion of the optic nerve, it is thrown into folds in eagles, vultures, and falcons, so that the folds hang loose in the eye; but in animals of ordinary sight these folds do not occur. The compound eye of insects like the fly and bee is associated with an optic brain-center of conspicuous dimension. The Schneiderian membrane in the

nose of man is spread over a surface of only twenty square inches, while in the seal it covers one hundred and twenty square inches; and so great is the power of smelling in the seal that hunters are obliged to approach him directly against the wind, else he would recognize them by their smell.

These cases tend to prove that in nervous matter, as well as in those cases where the exercise of an organ is connected with mechanical force, Size *is* the measure of power. In laying down this principle with reference to the mental organs, however, we are always careful to put in the qualifying clause, *other things being equal.* If we were to compare a pine stick with an oak stick, or an oak stick with an iron bar, it is obvious that the law of size being the measure of power would not hold good, because of the different properties of these different materials. In estimating the power of a mental organ from its size, in like manner, there are influences which enter in as modifying conditions, and which it is of the highest importance to take into account.

* * * * *

(*To be continued*).

It is only by training all together—the physical, intellectual, and spiritual elements—that the complete man can be formed.

FAT AS FOOD.

A READER, G. H. I., of Titusburg, sends quite a long defense of fat. His first argument is that laboring men and others eat it and say "it makes them stronger to endure hard work."

What "people say" in such cases is not very accurate. A great many people say that alcohol helps them to work—that they could not get along without it. But accurate scientific investigation has shown that they can work better without it than with it, while the experience of thousands of total abstainers proves it. So the scientific experiments and investigations of Pereira (quoted in the article to which Mr. I. refers in the Nov. number of the PHRENOLOGICAL JOURNAL) show that in the cases quoted, in repeated and fairly made experiments, fat failed to keep the body in health and strength and good condition. The conclusion that fat is not necessary is further justified by the robust and increased health and strength of the people who have ceased entirely to use it. It has been tried by many hard laboring men as well as the sedentary, and they declare that the less fat they eat the stronger they are, the warmer they feel, and the more work they can do, as in cases of wood-choppers and others that might be quoted.

The experiment of feeding dogs solely with fat was tried in France by an eminent physiologist. The dogs became emaciated, lost in vigor and activity, and finally died from inanition.

Boussingnault experimented in the same way with ducks, and with the same result.

Lately, experiments in feeding the German army have culminated in the declaration that the best physical results were obtained by supplying a ration composed of bread and a preparation of dried pease.

The writer of the article referred to has traveled much and observed closely; has

visited twenty States of the Union, and lived in several; has been familiar with the habits of working-men from childhood up; has taught school, and "boarded around" among farmers and other working-men; can work hard herself, manually as well as mentally, and has done so, and, moreover, has tried the experiment of eating fat and of doing entirely without for a long time, which is more than Mr. I. professes to have done. With all kindness we recommend that he try the doing without faithfully, and perhaps his "theories" of the value of fat may "set, never to rise."

We are a little surprised that he should quote the Jews as fat-eaters. We do not know what degenerate specimens he may have found who use *lard*, but we do know that to the true Jew the hog, and all its products, is an abomination; we know that here, where Jews abound, they are so very particular about the healthfulness of their meats that they have their own butchers who are noted for having the best flesh meats in the market, while any one who has frequented slaughter-houses knows that the fattest animals are by no means the healthiest. Of all people in the world the Jews are the most faithful to their traditions and ancestral teachings, and of these the elimination of fat from their food is one of the most definite. The injunction is emphatic and repeated: "It shall be a perpetual statute to you throughout all your generations that ye eat neither fat nor blood" (Lev. iii. 17). Again and again in ordering the manner of the sacrifices they are directed to burn the fat. In Lev. vii. 23–25 the whole subject of fat-eating is gone over—they are told that they may use fat for other purposes, but they may not eat of it under severe penalties.

We do not say that the Jews now are faithful to all their ancient laws and traditions, but we have reason to believe that they eat much less fat, and certainly less pork and pork fat, than their Gentile neighbors.

While this may conduce to their healthfulness as a race, there is another habit which probably has far greater influence—their comparative temperance. They are not a drinking people. They do not poison themselves so deeply as other people do with alcoholic liquors. With all the rest we do not admit that they are the healthiest people in existence. Such broad assertions are not easily proven, and injure rather than help an argument.

If Mr. I. wanted a case where the people are known to eat largely of fat, he should have quoted the Esquimaux. The conclusions drawn, however, would have been all in our favor. They are a lazy, stupid, sickly people, rapidly dying off with consumption, their condition largely confirming the conclusions drawn from the fat-feeding to animals quoted by Pereira.

It is the object of this journal, and especially of this department, to instruct and help all classes alike. While the fact is recognized that a laboring man may work off a certain quantity of fat meat, etc., with less apparent injury than the sedentary, yet we consider it healthful, conducive to strength, and therefore very economical for us all to omit the eating of fat.

We would remind Mr. I. in passing that we do not always need the amount of fat that we may have. The body may be plump, the muscles moist and in good condition, and the healthful juices of the system may be abundant without much fat. These things are often confounded by those who see only skin deep. Like the herbivorous and graminivorous animals, we can make all the fat we need from such food.

TO STOP NOSE-BLEED.—A correspondent of the *Druggists' Advertiser* says: "The bleeding may arise from an impoverished state of the blood, or it may be the symptom of some other disease. If the attack gives rise to serious apprehension seek the advice of a physician. At times simple remedies relieve great ills, and perhaps a knowledge of the following simple remedies might prove serviceable. Bleeding may be stopped by raising the arms above the head; sponging with ice-water the forehead and face; applying a towel wet with cold water between the shoulders; or by the application of a strong solution of alum to the inside of the nostrils, or plugging the nostrils with lint or cotton-wool soaked in this solution."

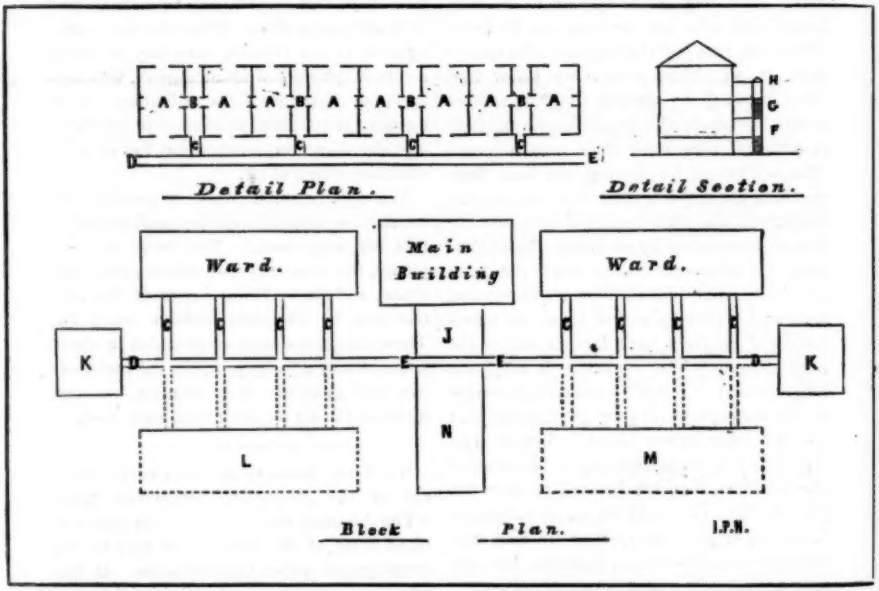
HOSPITAL CONSTRUCTION.

SUGGESTION FOR THE COMBINATION OF THE PAVILION AND CORRIDOR PLANS.

IN the Pavilion Hospital plan the public wards are all large rooms, and, on an average, contain from twenty to thirty-two beds—the larger the hospital the larger the ward. These large rooms, with a large number of patients, have certain disadvantages in heating, ventilation, etc., which it would seem desirable to remedy if possible. The great advantage of the pavilion style of ward is its abundance of light, but abundance of light alone is not sufficient to make a hospital ward perfect as an institution for the treatment of the sick.

In the Corridor plan the rooms are arranged on one side and the corridor on the other. There are certain points of cosiness and convenience about it which make this plan, at present, the favorite arrangement for insane hospitals; but as a general hospital for the treatment of the sick, it is not in very general use, although we understand that it has some advocates for this purpose. It has one special advantage, in that it can be arranged in small rooms, but it is claimed, for various reasons, not to be equal to the pavilion ward. It has light only on one side, so that the wards are not liable to get all the advantage possible from this important element in the treatment of diseases; then the corridor being thus close to the ward, the air thereof is apt to be affected by it and the ventilation as a whole interfered with.

As a general law, the larger the room the more difficult it is to heat and ventilate it; a hospital ward is no exception to this rule. The more patients brought together in one room the more contamination to the air, and generally the more difficult it is to treat patients in a satisfactory manner. Again, with our personal experience in a hospital, it is not at all agreeable to a sick man to be in a large room where there are so many other patients constantly before his eyes day after day. This repulsive sight is not at all



beneficial to a patient's case, and is a serious drawback in the large-ward plan, to say nothing of the inability to properly heat and ventilate the apartment.

In the plan herewith submitted, the wards are all of a size and contain only four beds each; the rooms are the width of the building, the same as in any regular pavilion hospital, and in length occupy the usual space allotted to about four beds in the large-ward plan. The wards are arranged in sections of two rooms each with a small hall or ante-room between.

A, A, Rooms or wards.

B, B, Halls.

C, C, Connecting Corridors.

D–E, Communicating Corridors. (See "Detail plan.")

In order to have windows on both sides of the general ward building, the same as in any regular pavilion hospital, the corridors are only of sufficient height for passages; the space from the ceiling of the lower to the floor of the upper story is left open for the play of light and air, the corridor being supported on posts or pillars.

F, Space for corridor, 1st story. (See Detail Section.)

G, Open space for light and air.

H, Space for corridor, 2d story.

These corridors to be roofed in and made weather-tight, and furnished with windows, etc.

In addition to the "Detail plan" and "Detail Section," a "Block plan" is also presented, showing the arrangement of wards and, provided it was desirable, the method of introducing extra wards in the rear of the main or front wards.

J, Covered space with stairs, lift, etc.

K, K, Water-closets, etc.; well isolated from the wards.

L, M, Rear wards.

N, Kitchen and general working department, hall, etc.

This plan being a combination of the regular, pavilion, and corridor plans, its advantages are: division into small individual rooms that are well lighted and can be more easily and efficiently heated and ventilated than the large wards of the pavilion plan or the closer rooms of the corridor plan. Again, the nurses, when not occupied with their patients, are provided with an accessible and comfortable place in which to stay where they may be out of the debilitating influence or atmosphere of the wards as much as possible.

Each ward, containing four beds, can be provided with a large fire-place, for which so much is claimed in the way of ventilation.

In this plan no individual or isolated apartments as such are particularly necessary, for they are all isolated and individual.

Each little ward here is a parlor in itself, and may combine all the advantages of a large room together with other advantages which it is impossible to attain in such an apartment as a large ward.

It may be said in disadvantage of this plan that it may require more attendants than the large-ward or pavilion plan, and that this would add to the working expenses of the hospital. With all the modern improvements in electricity, etc., we think that the cost for attendants need not be much larger for this than for the pavilion plan; while in regard to the corridor plan, there could be no marked advantage in this respect. Again, it may be said that there are more walls to build, and that this would add much to the cost of a hospital. Expense, however, judging from the many extravagant hospitals throughout the world, has not been much considered, provided there was some compensating gain following it; and this is as it should be. Of course mistakes may sometimes be made, yet, as a whole, *cost* should be a secondary matter in these constructions, provided a worthy object was attained that has not heretofore been attained or could not be attained without it.

As to methods of heating, ventilating, and arrangements for the various offices, conveniences, etc., appurtenant to a hospital, these I do not mention, as necessary modifications would be naturally suggested in the course of arranging a building in accordance with my plan. And all things generally combined in a good hospital may, we think, be practically combined in this plan.

This arrangement for the combination of the pavilion and corridor plans is hereby respectfully presented as a suggestion to those interested in hospital construction.

ISAAC P. NOYES,
(*Architect*), R. I.

CITRON FRUITS--THE LEMON.

Classic Mention—Habitat—In the Market—On the Table—Hygienic Use—A Hygienic Condiment—Wholesomeness—Lemonade.

THE lemon is more widely known and more generally, if not more largely, used in this country than the orange. There is scarcely a country grocery store that does not make the attempt to keep lemons on hand with success during more or less of the year. They are not called for on the dessert table, but the cook makes lemon pies when oranges can not be afforded for dessert, and the old apple-woman has her pail of lemonade on every corner all through the hot days of summer, when we are content to pay as much for the lemons as we pay for oranges in their season.

CLASSIC MENTION.

The lemon tree was originally from India. It is said to have come from Persia to Greece during the later days of Grecian and Roman glory, and the fruit was used only to keep moths from clothing—a use now quite neglected. They could not eat a fruit so austere and acid, and they had not learned to use it in their cookery. They could devise and use garum, but lemon juice was beyond the scope of their management. Even Apicius could not use lemons, though it is said that he devised a method for preserving them, putting them each into an air-tight vessel, hermetically sealing it and suspending it near the ceiling. Why he took so much pains to keep them when he did not use them, history fails to say.

Some have supposed this to be the tree which Virgil mentions as among the richest productions of India, and whose fruits were said to possess the greatest virtues against all poisons. The description given corresponds with that of the lemon, though we must remember that most descriptions in those early times were very indefinite and inconclusive. The value of scientific botanical descriptions consists in the fact that they draw the attention to those points which really distinguish one plant from another, and which are invariable or but slightly variable. The shape, color, taste, and flavor of the fruit may vary greatly in the same species, while the shape of the leaf, the form of its petiole, and even the convexity or the concavity of the little oil vesicles which prevail throughout the genus may remain the same. It required centuries of observation to learn what marks remained constant and decided the species, and thus to lay the foundation of this science, which has hardly yet settled its principles, its definitions, and its classifications. But even common observation has been so much sharpened by its influence that we no longer find people who sow oats reaping barley, and if they do reap cabbage when they thought they sowed turnips, they blame the careless sowing and not the seed.

It may be a new idea to some ladies, but it will be none the less true that the study of botany, besides its many directly advantageous results of bringing to our familiar acquaintance so large and valuable a department of knowledge, insures also a quickness and closeness of observation which of themselves would abundantly repay all the study. Add to this the beauty of the subjects and the healthfulness incident to securing specimens, and it proves itself a pursuit well worthy of every lady's attention, while this is just the time of year to commence it.

HABITAT.

The lemon tree is very like the orange in its appearance, growth, and preferences; but it is so overshadowed by the brilliancy of its more showy sister that we find far more scant materials for a satisfactory monograph. In many respects the lemon can follow the orange as the basket-selling squaw followed her English-speaking sister, and when the latter cried up her wares with all the resources of description her fluency could command, the other was obliged to be content with echoing, "Me too! me too!"

IN THE MARKET.

So at the docks in New York we find ships from the Mediterranean, from Spain, and from Portugal bringing both oranges and lemons in the same styles of long, slen-

der boxes, bound around with hoops, and holding about two bushels each, or about 350 oranges and 500 lemons, the numbers varying with the size of the fruit. The treatment they require is the same; they must be kept cool and dry, and the treatment they have received is the same, being picked before ripening, in order to keep a longer period, and very often we shall see traces of the green still on the rinds of both. Perhaps I need hardly say to my readers that the color of the lemon is far more uniform than that of the orange. A pale, bright yellow is always its prevailing tint, while the orange varies from almost as bright and as light a tint down to a reddish hue, scarcely less deep than that of the true scarlet geranium.

In the streets we see them both piled up in the hucksters' wagons, sometimes each occupying a whole wagon by itself, and again the lemons in one end and the oranges in the other, but the prices differ. Commonly you are advised of these by large sheets of manilla paper raised above the fruit. In the winter, when the market is full, you will see "20 lemons for 25 cts.," and not infrequently "25 lemons for 25 cts.," and sometimes "30 for 25 cts." has been reached. Oranges will range higher; "25 for a quarter" being very cheap, and usually of an inferior quality. The lemons may be large and fine, but the largest and finest oranges seldom grace the hucksters' wagons. For these you must look in the markets, where they are piled in handsome pyramids, cannon-ball fashion, or in the shops of the best grocers, where you find them still in the papers and in the boxes, apparently of their original packing. If they have been assorted and re-wrapped, they betray it by no sign. They are usually priced by the dozen; it being mostly street-venders who sell a certain number for twenty-five cents, which, by the way, is a common street-trick in New York. Of its former prevalence in the groceries, we see but one sign left now, and that is in the sale of eggs, it being very rare to find a grocer who will give you the retail price of eggs by the dozen.

But however closely our citron fruits may have traveled in company thus far,

ON THE TABLE

they are separated. The orange marches untouched and unchallenged to its destined place in the fruit dish, to offer its perfected flavors unchanged to the palate which has been excited by the appetizing appearance of the fruit. The lemon almost as invariably passes through the transforming precincts of the kitchen. But as if to make up for the lack of attention in the dining-room, the cook makes it one of her especial pets. She must have a few on hand continually. Many a dainty dish of chicken and game gets a dash of lemon juice or a sprinkling of the grated rind, or both. Many of the most elaborate gravies and sauces owe some of their piquancy to this source, though often unsuspected. With raw oysters and some other dishes, it is even sent to the table raw, yet usually in halves, as if in apology for its strong and acid tendencies, knowing that a little would be quite sufficient. It is also a grateful addition to many kinds of fruit, when stewed, to add a zest where there is a deficiency of flavor. A form of jelly that would be perfectly insipid, puts on a choice flavor of delicacy when reinforced with lemon. A cracker pie, than which nothing could well be more vapid, becomes like fruit when taken possession of by a lemon. So the equally tasteless corn-starch, with the addition of lemon juice and rind, becomes the favorite of pies when baked on crust. Time would fail to tell us of the cakes and the puddings, the charlotte russes, the meringues, in short, the interminable list of dishes which, under the hands of our modern cooks, owe an added charm to the lemon. Apicius is nonplussed; the lemon has its revenge. It even outdoes the orange.

HYGIENIC USE.

We welcome the lemon, notwithstanding its pronounced flavor. We shall take our choice, however. Not the rind, if you please, that is a little too much on the biting order; it gives warning beforehand, and we find no use for it in anything. If a little of the rind is stewed in our dried-apples or with our raisins, it is done with a protest. We know the lemon essences are made from this; that it constitutes the flavoring of syrups, custards, ice-creams, candies, and a

great variety of confections, usually without the accompaniment of the acid juice, but all that does not make it wholesome. It is well to make a pointed distinction here. It does not follow because the acid juice is good and wholesome and may be freely used, that the hot and acrid oil must share this wholesomeness. We may not therefore argue that "lemon" essences and flavorings are admissible. They must stand upon ground of their own, which perhaps we may discuss some day soon. On the other hand, it does not follow that all acids are to be received incontinently. Especially should we scrutinize the citric acids put up in various shapes for the acidulation of summer drinks. It does not follow that they are wholesome because they have a vegetable origin, even if you are sure of that. Strychnine has a vegetable origin, so has tobacco, alcohol, and many other poisons. Oxalic acid is a case still more in point. It is derived from sorrel and rhubarb; but though we may eat the sorrel or the rhubarb with perfect safety, the derived acid is a deadly poison. Grapes are wholesome, but tartaric acid could not safely be taken in any large quantities. The fact is, that the chemical change undergone in crystallization destroys the vegetable structure, and we have every reason to believe that with it is destroyed the power of affording nutriment to the human system. We can not therefore recommend the substitution of any of the fashionable crystallized acids, with or without sugar, for the unchanged lemon juice in the acidulation of drinks, or for any other dietetic use. If taken when abundant and canned, with the entire exclusion of seeds and skin, a good supply can be laid in against the ruling of higher prices, but of late their cheapness the year through seems to preclude the necessity for that.

As a

HYGIENIC CONDIMENT,

if we may so call it, we consider the lemon one of the best. If we put it to the test, we can eat it by itself, we are not afraid of it, and it is frequently done. We can not say so much of the oil nor of its essences. In our present transition state, when laying aside so many unwholesome condiments, we find the lemon juice and pulp of great use. We roll the fruit first, if it is hard, then cutting it across in halves we take out the pulp with a spoon, carefully remove the seeds, and it is ready for a sago and apple pudding, for a pearl-barley pudding, for a cocoanut and apple pudding, or a maize pudding, or we make of it, with thickened Graham flour and water, a pudding sauce—putting with all of these the necessary sweetening to make them palatable. Peeling off the outside skin, we cut the pulp into rings, and removing the seeds, cook it with our sweet raisins or our tasteless pears. A very little of it, with sweetening to soften it, improves greens and boiled cabbage to the taste of many, but we will not extend the list. Its

WHOLESOMENESS

of late has been greatly vaunted. We are told that it is good for rheumatism, good for consumption, and directed to eat it in quantities, with a faith which almost vies with that of the ancients, who considered it a specific against the poison of snakes; but in the cases mentioned the fruit had been eaten before the persons were bitten. Probably the previous eating was not considered essential, or it would not have gained much reputation in that line. Another point rather conflicts with our views. The preserved lemon-peel was considered one of the best digestives, and was recommended for this reason to weak and delicate persons.

To return to our own times, we do not doubt but that lemons may be beneficial in some of the cases indicated, especially where there has been a deficiency in the use of acid fruits, but we would have still greater faith in the constant and moderate use of milder fruits. We have known of many cases of free use of lemons without apparent harm, but for our own eating we should prefer apples and oranges, which contain the same acids, the malic and the citric combined, with a much larger proportion of nutritious food. One of the greatest demands is for its use in

LEMONADE,

and here again we think its use quite allowable. Doubtless, people often drink too much of it, which difficulty could easily be obviated by making it less sweet, and still fur-

ther by making themselves less thirsty with salt and other condiments. With all due regard, however, to these precautions, it often happens that the waste of fluids from the system in hot weather is greater than the supply can readily be made by the medium of fruit juices. In that case a little weak lemonade, very lightly sweetened, if at all, or oatmeal water, is much more satisfying than water alone, and far safer than ice-water. These and many other facts indicate that fruits and fruit juices are the normal source of the proper fluids for the system, and perhaps in the good days coming, when man shall be sufficiently master of the elements to maneuver all necessary machinery by a hand upon a lever, we shall be able to solve so much at least of the vexed drink question. This much we have already ascertained, that lemons and sugar with water alone are far better for quenching thirst than they are with the addition of wine and brandy, and we hope to see the day that will not tolerate such a waste of good things as happened over a century ago in that "age of powder and suppers," when the Earl of Russell, Commander-in-chief of the British forces, spread a collation in the avenues of his beautiful garden, which were bordered with lemon and orange trees. In the center was an immense marble basin containing the punch, composed of four barrels of brandy, one pipe of Malaga wine, eight barrels of water, twenty-five thousand citrons, eighty pints of lemon juice, thirteen hundred weight of sugar, five pounds of nutmeg, and three hundred biscuits. "In a charming little rosewood boat a cabin-boy belonging to the fleet rowed about on the surface of the punch ready to serve the company, which numbered more than six thousand persons."

Lemons are easily raised, the pips grow readily, and the leaves are as fragrant as those of the orange, but not quite so large. We have seen them in private sitting-rooms hung with fruit and spangled with flowers, which shed a delicious perfume. The wood of the tree is of great value in cabinet-making, and the ancients found a variety in Northern Africa which made tables more valuable than those inlaid with gold.

JULIA COLMAN.

NOTES IN SCIENCE AND AGRICULTURE.

Remarkable Meteorites.—A summary is published in *Nature*, giving some particulars of meteoric fire-balls which appeared in unusual number in this country in the latter part of 1876 and beginning of the present year. Prof. Kirkwood, of Indiana, is the authority. The circumstances attending the appearance of eight conspicuous meteors are included: the dates were 1876, July 8th (two fire-balls), December 16th and 21st, January 3d, 20th, and 23d, and February 8th. The train of the larger meteor of July 8th was visible at least forty minutes, the mass having been apparently dissolved or dissipated in the latter part of its track; the motion about the sun was retrograde, but sufficient materials were not forthcoming for determining the orbital velocity or the nature of the orbit. The fire-ball of December 16th had been visible but a few seconds near San Francisco, when it apparently plunged into the Pacific at no great distance from the shore, the fall being followed by a loud detonation. The meteor of December 21st was remarkable for the length of its track—between 1,000 and 1,100 miles, one of the longest upon record, and, moreover, the track would appear to have been somewhat curved When crossing Indiana the principal fire-ball was followed by a train of smaller meteors, many of which exceeded Venus and Jupiter in apparent magnitude; the breadth of the cluster, as seen from Bloomington, was 3°, and the length at least 20°, from which Prof. Kirkwood concludes that the true diameter was five miles, and the length about forty miles; several explosions occurred during the passage of the meteorite over Indiana and Ohio and a fragment weighing about twelve ounces, fell upon a farm near Rochester, Indiana, a part of it being secured by Prof. Kirkwood. The body is described as "peculiar in its structure; being pisolitic and remarkably friable." It is inferred that no part of the mass could have escaped out of the atmosphere. The aerolite of January 23d, or rather a portion of it, after the final explosion, reached the earth in Kentucky, and is now in the collection of Dr. J. Lawrence Smith, of Louisville. The report is stated to have resembled discharges of heavy ordnance, in such close succession, that the different discharges were barely distinguishable; height at first appearance about seventy miles.

A Telescopic View of Mars.—The sidereal revolution around the sun of the planet Mars is performed in 687 terrestrial days, or, as seen from the sun, it comes again in that time into the same relative position with any fixed star. When a planet rises as the sun is setting, it is said to be "in opposition," because it is then in that part of the zodiac which is opposite the sun. Were the earth at rest in space, Mars would be in opposition every 687 terrestrial days, but as it also revolves around the sun, the oppositions of Mars occur every 780 terrestrial days, or after the earth has made two rounds, and is fifty days on the third. Sometimes these oppositions take place when the earth is near aphelion, or farthest from the sun. If Mars at such a time be near its perihelion, or nearest the sun, it is seen under the most favorable conditions. Its distance then from the earth is about 34,000,000 miles, while when in opposition farthest from the sun, and the earth nearest, its distance is about 62,000,000 miles.

In September last there came one of these

THE PLANET MARS.

times of nearest approach, nearer than at any time within the last seventy years. In fact, no living astronomer has before seen this planet so near, under such favorable conditions, and with such powerful optical aid, as in the months of August and September, 1877. These conditions have been made the most of; for all over the civilized world the planet has been carefully scrutinized, and the details of its surface mapped nightly in scores of observatories, both public and private. In one of the latter the sketch was made which we present herewith, by Mr. C. W. Plyer, of Elizabeth, N. J., on the evening of September 19, 1877, at 10 hours and 25 minutes, Elizabeth mean time. The instrument used was an eight-foot telescope, with an object glass of 6¼ inches aperture, made by Mr. Henry G. Fitz.

The air was so hazy that stars of even the first magnitude were invisible, but so calm and equable that telescopic definition was almost perfect. The moon was full and was surrounded by a large halo, within which were Mars and Saturn. The white spot on the upper edge of the engraving is the "ice-cap," which is thought to surround Mars' south pole, as the paleocrystic sea surrounds the poles of the earth. There is a corresponding white cap around the other pole, but it was not then seen, the north pole being tilted away from us.

The more shaded portions of the disk are thought to be seas or lakes. The spectroscope demonstrates that water exists upon Mars, and the telescope shows these shaded portions of a greenish hue, like that of the oceans of our globe. The lighter portions of the engraving were seen of a rosy tint, particularly those which lie adjacent to the greenish seas. Toward the edges of the disk the color was gradually lost. In the lower part of the engraving, where the coast line is rounded, the observer saw a peculiar broken or jagged white band stretching many hundred miles along the shore. This feature, which was seen before and after the 19th, might have been due to clouds in the Martian atmosphere. Many English observers have noted such phenomena, and have sometimes seen these clouds disappear while watched. But Mr. Plyer has elsewhere expressed the opinion that there might exist on this shore a mountain chain similar to the great ranges of the earth, and that the broken and jagged bright band might be snow lying upon its peaks and flanks. Other sketches made by this observer on preceding and subsequent evenings, exhibit very clearly the ever-varying features of the Martian surface, and demonstrate that his rotation period is somewhat shorter than that of the earth.

New Spectroscope.—Mr. Christie has recently devised a new form of spectroscope, which, if the accounts given of it are to be depended upon, is really wonderful in its performance. The prisms employed are compound prisms of dense flint glass, combined with crown, put together in something the same way as the glass and bi-sulphide of carbon in the well-known Eaton direct-vision prism. It is said that an instrument of the new form, with two of the so-called "half prisms," gives a diversive power equal to that of twenty ordinary prisms, while the loss of light is vastly less. The theory of the instrument has been a good deal discussed, and some doubts are expressed as to its defining power, which can only be settled by a record of actual performance.

Celery taken from the trenches in quantity may be preserved in the cellar by placing the root ends in moist sand. Knowing this, country or city people who buy celery by the single bunch or so, might just as well buy it by the dozen bunches, thus saving time, trouble, and money.

Incombustible Writing Paper.—Two Spanish gentlemen, of Salamanca, have just obtained a patent in Spain for making writing paper incombustible. A number of experiments have been made with the

process, and the results are said to have been very satisfactory. The paper will not burn, no matter what may be the intensity of the heat applied. A single sheet submitted to the direct action of a flame will carbonize, but does not take fire. If a roll of prepared paper is placed in the hottest fire, the outside leaves will carbonize and the edges for a short depth, but the interior remains unaltered, the writing or printing being perfectly legible. Its cheapness especially recommends it for public documents, archives, etc., which might be desirable to preserve. Papers already written or printed upon may undergo the process without injury. The patentees expect to make an arrangement with the Government to apply the process in the manufacture of the paper used by it for public business, which can be done at a very trifling expense.

Improvements in Glass.—The success attending the efforts to toughen glass have led to a number of processes for improving the quality of glass, and among these is one for compressing glass under heavy metallic rolls. This compressed glass is reported to be even tougher than the "La Bastie glass," and has the advantage of greater freedom in working, so that larger pieces can be produced. The compressed glass has a fibrous texture, quite unlike the crystalline structure of the tempered glass. By the use of engraved rolls, the glass may also be ornamented at the same time that it is compressed.

The Late Transit of Venus.—The result derived from the contact observations of the Transit of Venus in 1874, made by the British expeditions, has been recently published. The solar parallax calculated from them amounts to 8″.76, which would give a distance of 93,300,000 miles—somewhat larger than has been thought probable since the recognition of the fact that Encke's parallax was too small. Thus the value which finally resulted from the observations of Mars at its opposition in 1862 was 8″.85; whilst Mr. Stone's amended reduction of those of the Transit of Venus in 1769 gave 8″.91. The observations in 1874 now referred to were made at Honolulu, New Zealand, Rodriguez, Egypt (Mokattam, Suez, and Thebes), and Kerguelen Island; the photographic results have not yet been completely discussed.

The Wheat Crop of 1877.—The latest estimate of the wheat crop of the United States for 1877 amounts to 325,000,000 bushels; the corn crop to 1,280,000,000. The wheat crop has never been surpassed, but the corn crop was better in 1874 and 1876.

Danger in Railway Travel.—M. Gartiaux has published some curious statistics on the dangers of traveling by land in France. He says that in the *diligence* days a man had one chance of being killed in 300,000 trips, and one chance of being injured in 30,000. On the railway between 1835 and 1855 there was one chance of being killed in 2,000,000 journeys, and one chance of being injured in 500,000. From 1855 to 1875 one chance of being killed in making 6,000,000 journeys, and one chance of being injured in 600,000. Now the chances of being killed are as one to 45,000,000, and of being injured one to 1,000,000. Consequently a person traveling ten hours a day at the rate of forty miles an hour, would in the first period have had a chance of escaping destruction during 321 years; during the second period in 1,014 years, and between 1872 and 1875 in 7,439 years.

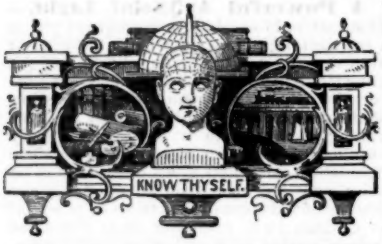
A Powerful Artificial Light.—That carbon bi-sulphide when burned yields a brilliant light, has long been known, but until recently no practical application of the knowledge has been made. A lamp has now been invented which insures the combustion of the dangerous oil with safety by first saturating pumice with it and subsequently burning it in a stream of nitrogen gas. The light which this lamp gives out is said to be more powerful than that obtained by any other artificial means. It is twice as powerful as calcium light, possesses three times the force of electric light, and is superior to magnesium. The chief use of the invention is in photography and for signal lights.

Ye Thistle, Avaunt.—A Maryland farmer thinks he has found a "sure cure" for Canada thistles. It consists in sowing the land infested by them with buckwheat early in the spring, allowing it to grow till it is in full blossom, turning it under and again reseeding with the same grain. The last crop is harvested when ripe.

Irrigation in Agriculture.—A Nevada farmer, who cultivates a ranch which but a few years ago was a sagebrush desert, says in the Virginia City *Enterprise*: "I have one field of eighty acres on my farm, which pays me two per cent. a month on two hundred dollars per acre. The land is worth a bit an acre, the water $199.87½ per acre. The same land could have been purchased six years ago for three dollars per acre. The miracle has been performed through the introduction and use of water. I would rather cultivate land that I can irrigate conveniently, than try to cultivate the same land without irrigation in a country where the rains fall as they do in the Eastern States. The stream of water gives me perfect command over my land. I plow when I please, I plant when I please, and when I get ready for harvest I know in advance that I am not going to be troubled by rain. Last year I cut eight hundred tons of hay, which, cut and stacked, cost me only $1 25 per ton. I was able to do that because I was not obliged to be careful about the weather. Sometimes I had one hundred tons of hay at a time lying in winrows in the field."

Telegraphy without Wires.—Professor Loomis, who has been in the mountains of West Virginia for some months conducting a series of experiments, has about concluded that telegraphing without wires is

practicable. His method of operating consists of running a wire up to an altitude reaching a particular current of electricity, which he claims can be found at various heights. At any distance away this same current can be reached by a similar wire, and communication can be had immediately. It is true that aerial telegraphy may not be much of a certainty during violent storms or electric showers, but Professor Loomis thinks that it will not meet with more obstructions than the ordinary wire telegraphing at such times. Professor Loomis has a scheme now on foot for a series of experiments from a point on one of the highest peaks in the Alps in Switzerland to a similarly situated place in the Rocky Mountains on this side of the world. If this succeeds, his invention will rank in importance with that of the electric telegraph itself.



MRS. C. FOWLER WELLS, *Proprietor.*
H. S. DRAYTON, A.M., *Editor.* N. SIZER, *Associate.*

NEW YORK,
FEBRUARY, 1878.

BIBLE FATALISM.

WE are not satisfied with the application which our friend Mr. Deem makes of the quotations from the Bible in his communication on Fatality. We think that they can not be taken as bearing a special relation to it. The first quotation, that of Mark v. 13, concerning the destruction of the herd of swine, shows indeed that they perished "by reason of an irresistible power." But it seems to us that the occurrence was a manifestation of power on the part of Christ for the purpose of convincing those around him of the authority he possessed as the annunciator of a special mission. As for the second quotation, that from Mark ix. 20, it is susceptible of an interpretation warranted by the pathology of the case. The young man who was subject to fits, which to-day would probably be regarded as a phase of epilepsy, may have inherited the disease, or it might have been produced through indiscretion, or the lack of physiological knowledge, so prevalent in that early time.

With our present knowledge of disease in view, knowing that hygienic measures are preventive—that where epidemics were wont to prevail at certain seasons of the year, care in the matter of cleanliness and diet has rendered them almost unknown—the doctrine of fatality in its morbid physical relations has lost its force in a very important particular. The case of Job which Mr. Deem has cited we regard as beyond the realm of logical discussion. On its very surface it includes psychological mysteries into which we are not able to penetrate.

The "parable of the sower" is occasionally referred to as illustrative of the phrenological principle of special endowment, but we can not take the fatalistic or absolute view of parts of it which Mr. Deem is inclined to take. Further, the soil which produces vegetation and the food of man is nothing more than disintegrated rock, rusted metal. So "rock," as typical of an obdurate nature, indicates a condition which is avoidable or susceptible of modification. Instances of reform from a life of the most vicious character are almost daily presented to our consideration. Even men who have been born and nurtured amid criminal associations have, by the operation of moral influences, been entirely changed; so that whereas the thoughts of such men previously were "only evil continually," they be-

came earnest, active agents for the good of others. Christ uttered a grand moral truth in Luke vi. 43, where he said good fruit can not be expected from a corrupt tree; but he nowhere says that the tree could not be improved by proper tillage. We are reminded of an illustration he gave in another place, of the vineyard and the husbandman. The Lord of the vineyard comes year after year vainly looking for fruit from a certain tree, and finally orders the vine-keeper to cut it down; but the latter asks forbearance, and an opportunity to give the tree special care, and then if it still prove barren, he will cut it down.

Organizations differ in capacity for growth, yet in all cases improvement appears to be the tendency of nature. Even idiots are susceptible of training and development. Many a child pronounced fatally diseased by the faculty, has, through the watchful care of a trusting mother, blossomed into health and remarkable mental vigor. No one who is familiar with the birth and childhood of the late Dr. John Todd should despair of any human organization.

Human life seems somehow or other not to be entirely amenable to what logicians and scientists define as law. We find strange things happening. There are now and then outcroppings of a totally different phase of character from what had been sanguinely expected. We hear people saying of this man or that woman, "Who would have expected one born as he or she was would have turned out so well?" There is a something within us which somehow or other tends upward. Call it *force* if you will, or *principle*—it appears to have a law of its own, the operation of which we have not yet fathomed.

We confess to a strong vein of optimism in our views of life, and our study of human nature has but served to strengthen this view. Mr. Deem will find material enough in Scripture language to give him apparent sanction for adherence to fatalistic dogma; so he will find in the same language material to sustain views anti-fatalistic. One remark in particular, pregnant with moral and philosophical suggestion, comes to mind: "But the manifestation of the Spirit is given to every man to profit withal." This we understand to signify that a certain amount of spiritual or moral inspiration or influence is implanted in or given to every man, which, if employed, will prove sufficient for his growth and meet the vexations and responsibilities which come within his sphere of action.

VILLAGE MUSEUMS.

"Wanted—a dozen or more, to establish and maintain a Museum of Natural History in every town and village."

THIS item *The Rural New-Yorker* somewhat happily comments on with regard to the intellectual profit derivable from the collecting and exhibiting of specimens illustrative of different departments in natural history. Our boys and girls are easily interested in the objects of nature, and nine out of ten in our schools would be delighted to assist in the accumulation of a museum.

As an element in education, we know of nothing more useful than a good museum, which embraces among its features specimens of birds, fishes, different woods, grains, fruits, grasses, minerals, insects, etc.; and it would not be a difficult task for every village which has a school to make up a collection of considerable value. All that would be required would be the leading of some earnest, intelligent person. The teacher should be the one to organize such a movement. The study of natural

history is a department of object-training, and nothing tends more to develop the perceptive and practical organs.

One very important feature should not be forgotten in the outset of an effort to establish such a collection—that feature is the study of Anthropology, one or more of whose departments can be made available quite as easily as the procuring of good botanical and geological specimens. A few casts of the heads of men and women noteworthy for intellectual talent and morality; a few contrasts illustrating ignorance, vice, imbecility; some portraits and diagrams exhibiting parts of the human anatomy; a shelf of animal and bird skulls—which are easily obtained, and essential to the study of comparative Phrenology—and a few descriptive text-books, would constitute a class or section in the museum which would prove as interesting certainly as any part of the whole collection. The editor of *The Rural* speaks strongly of the association of the departments of natural history with a public library, but neglects to drop a word in behalf of anthropology, which, in our opinion, is a *sine qua non* in true popular education. His case is by no means singular. Our newspapers and magazines abound with suggestions for the study of this or that department of natural science, but rarely drop a word in behalf of the most useful of studies—that of human nature. Had we control of the intellectual forces of the community, we would set young and old to work studying themselves to lay a solid foundation for the proper investigation of the world of nature. The key to success in the pursuit of any object is the comprehension of our ability to grasp all the facts and issues comprehended; in other words, it consists in a mastery of our mental capabilities, and their thorough adaptation to the nature of endeavor. Starting with a knowledge of ourselves, we can best obtain the knowledge of other men and of other things.

THE STUDY OF HEADS.

WE find by coming in contact with people who are constantly in connection with Phrenology, that there are many vague notions entertained by intelligent people on the subject. They are always talking about bumps and protuberances, cavities and hills on the head, as if it were by such indications that we estimate brain development. There are sometimes hills and hollows, to be sure, when there are great irregularities in the development of different parts of the brain; but the best heads are those which are the most nearly even and uniform and have neither bumps nor hollows.

When people are informed that our method of judging the size of organs is by estimating the distance from the capital of the spinal cord, which is situated as low as the opening of the ears, and half-way between them to the location of the organs on the head, it will do away with the idea of bumps, because if all the organs were equally large, and only developed according to the size of the head, the surface of the head would be smooth. If the head were large, the organs would all be large in such a case; and if the heads were medium, the organs would be of medium size. Sometimes a head is very uneven, one group of organs being large and another group comparatively small; for, strange as it may seem to one not observant in this matter, a man will sometimes inherit the front half of his head (all the region of the forehead) from one parent and the middle region (around the crown of the head) from the other parent. Such a one will have the

dispositions of one parent and the talent of the other. It is on the same principle that the eyes will have come from one parent and the nose and mouth evidently from the other parent. One man has black hair and blue eyes, or flaxen hair and black eyes, or flaxen hair and dark beard and brows; and everybody knows that these do not usually belong together—as light hair and light eyes, or dark hair and dark eyes are more commonly associated.

Every year the American Institute of Phrenology is opened for students, and one or more courses of instruction are given, and students who come several thousand miles to attend these lectures (who are interested in the subject and ought to be pretty well informed) are found to be laboring under this old error of "bumps," just as if a quarter of an inch on the surface told the whole story of large or small organs, and whether the head, as a whole, were small or large.

Phrenology is a most interesting subject, attracts deep attention wherever it is brought fairly before the people; and, indeed, has the approval, tacit or otherwise, of most of the learned; and it is our anxious desire to place in the field men and women thoroughly educated in its philosophy and practice, and well trained in other respects. There is no topic which is worthy the attention and study of the community which is not more thoroughly cultivated by the public than that of Physiology, the science which relates to the growth and health and vigor of the body; and of Phrenology, which relates to the philosophy of the mind's growth and action, and is therefore closely allied to physiology. The men and women who have talent and culture, who will undertake to bless the world by their teachings, will find in Phrenology a rich field; rich, because it deals with the highest entity on earth, man; rich, because of its internal as well as external remuneration; in other words, it gives the earnest worker a chance to do good and get paid for it. Besides, the field not being occupied as is that of law, medicine, or divinity, a man can choose his place of labor, and need not wait for a call or a settlement, but can locate where he will work when and how he pleases, and can have a following, and feel a consciousness that he is every day benefiting the world more than the expenses of his whole existence on earth will cost to the race.

As the next course of instruction in the American Institute of Phrenology will open on the 1st day of October next, those contemplating entry as students will bear in mind that there is to be no summer class, as, for two years past, there has been.

Any information in regard to the proper preparations for entering, and all other facts relating to it, may be obtained by addressing the publishers of this journal.

HOW LIKE AND HOW UNLIKE.

GLANCING through *Scribner's Monthly* for December we lingered most, as is customary with us—and probably we are not singular in this respect—in the columns of *minion* which contain the paragraph-thoughts of the editor, and there we found this:

"Doubtless their swallow-tail coats and white chokers help give to restaurant waiters their frequent resemblance to members of the distinguished professions. One of our most learned public men—or his double—may be seen any day carrying a tray in the dining-room of a hotel near Grace Church. The counterpart of a well-known Doctor of Sacred Theology serves at a restaurant farther up-town. When I dine at these places I feel like asking these gentlemen to

be seated and let *me* wait upon *them*. At the village of B. the barber looks so much like a certain reverend bishop that I can never get used to submitting myself to his professional attentions.

"But when you come to look closely into the physiognomy and phrenology of these doubles, you find a curious blankness; or, speaking artistically, a lack of firmness and of character in the drawing. Somewhere in the face or in the head is betrayed the want of intellectual or moral stamina.

"Do you not often feel something of the same lack in the faces of men whose reputation is wide? It would be interesting to note whether in such cases the reputation has not been made merely through the possession of extraordinary faculties of the mechanical sort—such as memory, application, etc.—faculties which generally go with genius and insight, but which often themselves suffice for the making of contemporary fame."

Our own impressions, and the impressions of every other systematic observer of men, doubtless, are parallel with these. In the restaurant, the shop, the factory, we meet with faces which at first set us to wondering why their owners occupy places so subordinate; but, on closer examination, our wonder ceases, and, perhaps, a feeling of pity enters into our contemplation. Scattered all through the employments which exercise chiefly the mechanical powers are men and women who might have risen to eminence or become the promoters of noble and useful objects had their mental organizations been developed by fitting tutorage; but, lacking that, they have grown up unconscious of the faculties within them and gravitated into vocations of subordination and repression. The "curious blankness" mentioned by *Scribner's* editor is due to the atrophy or quasi paralysis which has affected the fine intellectual endowment by reason of its little use in the more than half automatic service of a restaurant waiter or barber, while the "lack of firmness" is one of the fundamental causes of the weakness and general inefficiency of the character.

Our Mentorial Bureau.

To Our Correspondents.

QUESTIONS OF "GENERAL INTEREST" ONLY *will be answered in this department. But one question at a time, and that clearly stated, must be propounded, if a correspondent shall expect us to give him the benefit of an early consideration.*

IF AN INQUIRY FAIL TO RECEIVE ATTENTION *within two months, the correspondent should repeat it: if not then published, the inquirer may conclude that an answer is withheld, for good reasons, by the editor.*

WE CANNOT UNDERTAKE TO RETURN UNAVAILABLE *contributions unless the necessary postage is provided by the writers. In all cases, persons who communicate with us through the post-office should, if they expect a reply, inclose the return postage—stamps being preferred. Anonymous letters will not be considered.*

ASSASSIN.—H. L.—My Sunday-school teacher informed the class a few weeks ago that "that Egyptian," mentioned in Acts xxi. 38, was one of the so-called "assassins." Please tell me if this is true, and if not, who the assassins were?

Answer: Your teacher made a mistake. "That Egyptian" was simply the leader of a mob of thirty or forty thousand against the Mount of Olives. The "assassins," *hashish-smokers*, were a secret political society of the middle ages. It originated in Persia about A.D. 840. There were seven degrees through which an individual selected to become one of the band had to pass. In the first degree the mind of the novice was purposely perplexed on matters relating to the Koran, that his conscience might be dulled. In a later degree, he was bound by an oath to unconditional and unquestioning obedience. Thus they were passed on and on, initiated deeper and deeper in wickedness, until they were ready to do whatever bloody deed they were bid. They frequently intoxicated themselves with hashish, in order to nerve themselves for performing their allotted crimes; hence their name, *Hashhashin*,

which was corrupted by the Crusaders into "assassin." Since that time all who commit secret murder in a cowardly way have been called assassins. Sheikh el-Jabel, more commonly known as "The Old Man of the Mountain," was the most prominent leader. Jelal ed-Din Malek, Sultan of the Seljuks, having at one time sent an ambassador to the grand master of this order, asking him to surrender, the master called into his presence several of his followers. Beckoning to one of them, he said, "Kill thyself," and the man instantly plunged a dagger into his heart. Another he commanded, "Throw thyself from the rampart," and in a moment he was a mutilated corpse in the moat below. Turning then to the envoy, the grand master said: "Go tell thy lord that in this way I am obeyed by seventy thousand faithful subjects." Up to about the year 1400 they continued with more or less power, but since then there has been but little known of them. Those who remain in some parts of Persia and Lebanon practice some of the doctrines of the old band, but retain none of its fierce, murderous spirit.

SPINAL AFFECTION.—"Spinal irritation," so called, is due in large measure to stomachic trouble, and is curable. If there be actual disease of the spine it is very difficult to treat, and in most cases incurable. We would not advise you to eat honey for your brain and spine. Your system has enough of carbonic matter in it already, and your food should be so regulated as to relieve it of the excess. You need the nutrition which food containing nitrogen and phosphatic matter will supply. Eat tart fruit to stimulate your liver. Frequent manipulation or rubbing of the spinal regions would be beneficial, at least in so far as relieving your pain in a good degree.

MIND READING.—*Question:* Can you explain why it is that four or more persons joining hands around another person who is blindfolded, their finger-tips lightly touching the subject's waist, can, by steadily thinking of a certain object, cause the person to go toward and find that object, although he may have no previous knowledge as to where or what the object is?

Answer: This is one of the unsolved problems of psychical life. We have heard of some remarkable performances by mind readers, they themselves being unable to account for the impressions or influences which enable them to accomplish their results. Mind reading is evidently due to some power or process of a physical sort to a great extent, but whose nature is as yet beyond the reach of scientific manipulation. Many theories have been ventured, and a good deal of speculation indulged in in regard to this matter, but it is still a cloudy subject.

INTOXICATION.—J. A. T.—The symptoms of intoxication differ in accordance with the temperament and organization of the intoxicated. This you, as a physician, know, of course. It is necessary for one to know the characteristics of the person in order to be able to judge by his conduct whether or not he is under the influence of moderate alcoholic excitement. One so excited usually acts in a manner out of keeping with his general disposition. There are some persons who are so organized, and have gotten into such habits of speaking and acting, that they seem "half seas over" most of the time to the world at large, while they may not be given to drinking. Of course, it will be necessary to have a different standard for judging such. Usually when a man is under the influence of liquor, the organs in the lower part of his head, or the propensities, are congested and stimulated, and his speech and actions indicate a lack of moral discernment. He says and does things which are more or less improper, and if the excitement be great, he may do violence.

IMAGINATION—D. C. L.—Imagination depends mainly on the organs of Ideality and Sublimity. If one be deficient in these organs, a measure of improvement will be obtained by the study of works that are mainly the product of the imagination or fancy. The reading of poetry, of the higher class of novels, the contemplation of fine scenery, and association with people of fine poetic natures will help in this regard. The study of any good treatise on Phrenology will give you further hints.

GALLANTRY.—W. P. J.—When a gentleman escorts a lady anywhere, whether it be to church or to the concert room, he should remain near her. His proper place in the church is at her side during the services. He may leave her for a moment at the entrance if they are both strangers in the temple, for the purpose of making inquiry in regard to seats; but on finding places, he should return to her and escort her to them. If it be agreeable to the folks at home, it is entirely proper for you to invite a friend to take dinner with you on Sunday. Our opinion is adverse to the marriage of cousins.

FRENCH SOCIETY.—A. B. C.—Not long since a little book, written by a traveled author, appeared with the title, "How they live in Paris." This would probably meet your wants. We think the price is about $1.25, and would procure it on receipt of your order.

DYSPEPTIC.—P. W.—Dyspeptics are usually affected with nervous excitement, and such a systemic condition is but a natural outgrowth of their stomachic disorder. It would require much space to cover the field in prescribing for your ailments. It would be better to re-

fer you to some standard work, like "Digestion and Dyspepsia," by Dr. Trall, which was prepared expressly for the treatment of cases like yours. You will find the book in our list.

VEGETARIAN GROUP HOME.—Mr. Oliver Taylor, of Mount Pleasant, Monroe County, Alabama, desires information on this subject. Will those interested in the movement please communicate with him?

TEMPERAMENTS.—N. C.—In the course of a series of papers on the "Brain and Mind," now publishing in the PHRENOLOGICAL JOURNAL, you will find the Temperaments considered, both according to the old nomenclature and the new.

What They Say.

THE PRISON-BOUND.—I am interested in Phrenology, and have been from a child, and believe if people generally took more interest in the science, we might some day look for better men and women developed from better children. No allowance is made to-day for the criminal who is simply a result of misunderstood laws and the most egregious selfishness. "The parents have eaten sour grapes, and the children's teeth are set on edge," and there is little help for the majority of these suffering ones. These unfortunates should not be left to themselves, and to the tender mercies of those who view them as "wretches" and "corralled wolves," and who believe that "prisons were not intended for reformation, but for punishment." It might, perhaps, be well to leave these unfortunates to their misery, if by so doing crime could be prevented; but while the ignorance and selfishness of mankind are breeding criminals by the thousands daily, it is well to make an effort for the fallen, while at the same time we seek to educate the people into a condition where they will understand that *crime* is *disease;* then, they will take different measures with unfortunate humanity, and will give their best efforts toward the creation of immortal souls that they may in reality be but "little lower than the angels." I am in receipt of letters daily that cause me to keenly feel our injustice as a people. But a few days ago the judge of a court in Lowell, Mass., sent a little boy seven years old to the Reform School for two years for truancy. Who can wonder that our unfortunates believe that even God is against them! They judge of God from what they know of Him; and what do they know of good in their false or limited life? God help us to see our way out of the misery which encompasses us! But "God helps those who help themselves." We have got to think before we can accomplish anything. To-day we are moved by impulse and "what people will say." When will the to-morrow come when we shall care only for what we think of ourselves? Not till *thought* drives Mrs. Grundy from the field and causes us to realize that in order to have a good harvest we must see to our planting—must have good ground, good grain, and as good care. We have so much to learn as a people. Humanity needs help. Let us teach our children to do right for right's sake, for the sake of all that is sweet and beautiful in life, and let us all do more as we would have others do by us, or even setting aside this, do good for the pure love of it. Then shall we have what humanity has vainly prayed for these many, many years, "Thy kingdom on earth as it is in heaven."

MRS. M. S. W.,
Charlestown, Mass.

HOW SOME PHRENOLOGISTS WORK.—*Editor of the Phrenological Journal:* Permit me, although a stranger to you personally, to address you, as a friend to your valuable journal, as well as one interested in the science of Phrenology. Some years ago I was a reader of the JOURNAL and something of a student in the science, but for a few years past little has been heard among us on the subject, until a few days ago Mrs. P. W. Irving, a graduate of the Institution under your direction, I believe, came to our village, and during her stay examined the heads of several of our most prominent citizens. Mrs. Irving evinced a knowledge of the science of Phrenology to the satisfaction of those best versed in that science among us, reflecting credit not only on herself as a practical student, but upon the Institute whose fame for thorough and superior instruction is almost world-wide.

In my humble opinion Phrenology is *the* science to be understood. To know one's self is wisdom, is power, yea, is *life*. But to be able to instruct men in a knowledge of themselves and of their fellow-men seems beyond human capacity. How much of the old superstitious creeds would fall to the ground were the masses educated in the knowledge of Phrenology and Physiognomy, and the complaints of injustice in the Supreme Judge (whose laws are everlasting in "visiting the sins of the fathers upon the children, unto the third and fourth generations") would be withdrawn. Yea, an understanding of these branches of science lights up even the sacred page, and enables humanity better to comprehend Deity. Hence, allow me to congratulate you as public benefactors in teaching this divine science, and my prayer is, that your labors may be rewarded in seeing much fruit, even "an hundred-fold," in this life, and that the cycles of eternity unfold to your ever-increasing admiration the glories of the celestial realms until you become as familiar with the mind and character of the Great Creator as you are now with the organs of the human mind.

Yours truly,

Dalton, Mass. F. S. B.

Library.

In this department we give short reviews of such NEW BOOKS *as publishers see fit to send us. In these reviews we seek to treat author and publisher satisfactorily and justly, and also to furnish our readers with such information as shall enable them to form an opinion of the desirability of any particular volume for personal use. It is our wish to notice the better class of books issuing from the press, and we invite publishers to favor us with their recent publications, especially those related in any way to mental or physiological science.*

THE CEREBRO CONVOLUTIONS OF MAN. Reported according to Original Observations; established upon their Development in the Fœtus. Intended for the Use of Physicians. By Alexander Ecker, Professor of Anatomy and Comparative Anatomy in the University of Fribourg, Baden. Translated by Robert Eden, M.D. New York: D. Appleton & Co., Publishers.

Dr. Ecker hits the true principle of observation in regard to mental phenomena, when he tells us that "it is only by actual observation, in connection with the most careful autopsies, that we can gradually arrive at some knowledge of the physiological meaning of the single convolutions from the cerebral surface." It is impossible to obtain definite results through the process of vivisection, and it appears to us to be a matter of wonder that so many gentlemen learned in physiology should insist upon an exploration of brain in the living subject for the determination of psychic peculiarities. The object which Dr. Ecker has in the preparation of this treatise is the mapping of the brain in a systematic manner, so that investigators shall be enabled to meet upon a common ground in their discussions of its various parts. The old divisions are totally unsuited to modern anatomical intelligence, being mainly arbitrary and not dependent upon the anatomical structure. Messrs. Gratiolet, Huxley, Turner, and Baker have given considerable attention to mapping of the brain, and Dr. Ecker presents the tabulated results of their operations. He gives careful directions for the examination of the brain, but does not appear to have learned the peculiar process exhibited by Drs. Gall and Spurzheim to admiring assemblages of the best anatomists of Europe and America.

BEAUTIFUL HOMES, OR HINTS IN HOUSE-FURNISHING. By Henry T. Williams and Mrs. C. S. Jones. Vol. 4. Williams' Household Series. pp. 315. Cloth, price $1.50. New York: Henry T. Williams.

American homes have a friend in this enterprising publisher. Volume after volume has been issued by him with the motive to instruct the housekeeper and house-owner with respect to the march of invention and discovery in things pertaining to home improvement. We are told in the Preface that "household taste is but a synonym for household culture; and she is a wise woman who surrounds those she loves with objects of beauty; for she may safely rely on the influences (so intangible) which the beautiful (both in nature and art) ever exerts in a moral, intellectual, spiritual, and social point of view. The beautiful picture or softly-tinted wall, the peaceful drapery or chiselled statuette may perhaps be the means of opening some fount of wisdom else closely sealed or touching some sensitive nerve of thought otherwise dormant." To all this we agree with especial heartiness, if in the endeavor to educate through the artistic practical considerations are not lost sight of. Too much art culture gives a distaste for the plain utilities of every-day life, and there is a tendency in the growing love for bric-à-brac, and beautiful nothings, which is conspicuous to-day, to lose sight of the solid moralities of useful things. "Beautiful Homes" discusses in twenty chapters the esthetics of furniture and other appointments of the household. It is designed not only as a guide in the selection of articles of use and ornament, but also in their home manufacture. With such a book as this at hand, no housekeeper, if she have leisure from the "endless routine of duty," need sigh in vain for things to make her rooms "look nice." Very richly illustrated.

HOUSEHOLD HINTS AND RECIPES. By Henry T. Williams and "Daisy Eyebright." Part I., pp. 156. Price, paper, 50 cts. New York: Henry T. Williams.

This compilation will be found a very convenient assistant to the housekeeper of economical disposition. Some of our friends preserve scraps cut from newspapers and periodicals or the publications entire, which contain hints and recipes of value, but when an emergency occurs it is usually found a matter of much difficulty and delay to hunt up the one scrap or paper which they *know* is just suited to the case. Having a little book like this at hand, with its complete index, a moment's search finds what is wanted, and expedition is usually an accompaniment to success.

CONTRIBUTIONS TO OPERATIVE SURGERY and Surgical Pathology. By J. M. Carnochan, M.D. With Illustrations from Nature. Part III. Quarto. Price 75 cts. New York: Harper & Brothers.

The contents of this number of Dr. Carnochan's valuable series include a case of amputation of the entire lower jaw for necrosis, etc. Remarks on amputation of the entire lower jaw; A case of amputation of the entire lower jaw for osteo-fibroid tumor, twice; On shock and collapse, the primary treatment of injuries, etc. The first operation noted was accomplished by Dr. Carnochan in fifty-five minutes, in presence of the hospital staff and several prominent sur-

geons at the Emigrants' Hospital on Ward's Island. The patient, Nicholas Donegan, aged forty-three, recovered entirely, and subsequently pursued his calling of a dairyman. The second case was that of a lady aged forty, whose entire lower jaw was also successfully removed, for tumor. Both cases (the first instances of the kind known in this country) are described with the minuteness requisite to make them fully understood and valuable as guides to the surgical brotherhood, and are at the same time of surpassing interest to the lay reader, as showing the wonderful achievements of which surgical skill is capable. Beautiful full-page lithographic presentations of the cases accompany the text.

THE ELEMENTS OF TACHYGRAPHY. Illustrating the first principles of the art, with their adaptation to the wants of literary, professional, and business men. Designed as a text-book for classes and for private instruction. By David Philip Lindsley. Fifth edition. Price, cloth, $1.75.

The title describes this recent candidate for attention among the writers of short-hand. Tachygraphy, however, can not be said to be an entirely novel process of brief-writing, as it has been more or less in use for more than twelve years, and the inventor has been encouraged to issue several editions of his first compendium which was published in 1864. The basic principles of Mr. Lindsley's system are substantially the same as those of Pitman's phonography and the main feature of difference is in the assignment of special outline signs to the vowels for the purpose of their insertion in the word forms, so that the manner of writing is similar to the ordinary long-hand. This, of course, is an advantage; and, on account of it, the stenographers who employ tachygraphy claim for it a superiority over phonography in facility of acquirement and legibility, while phonographers reject with much positiveness any such assumption. Allowance must be made for the disposition of short-hand writers to vaunt the excellence of their respective systems. Time will show whether Pitman or Lindsley or Scovill has brought to light the best system for all practical purposes. Meanwhile, as phonography has the great majority of disciples, and its adaptation to the requirements of business and art appears almost complete we can scarcely expect it to yield ground easily to a younger system, although it may be demonstrated to be a better one.

JOE'S PARTNER. By the author of "The Blue Flag," "The Jewish Twins." 18mo, 128 pp. Price in cloth, 50 cents. New York: National Temperance Society Publication House.

A pleasant little volume for boys and girls to read, conveying excellent lessons of practical morality.

PERSONAL ITEMS.

THE death of the venerable Cyril, Patriarch of Jerusalem, is announced, in his eighty-seventh year. He was born on the Island of Samos, and became Patriarch of Jerusalem in 1845.

WILLIAM WIRT HENRY, a grandson of the genuine old original PATRICK, has just been elected to the Virginia Legislature.

SENATOR BECK, of Kentucky, is very large and has crisp curly hair. He shows his Scotch derivation in temperament and expression. He is solid, square-cornered, and emphatic.

SENATOR ROLLINS, of New Hampshire, looks dyspeptic, and probably is. Most of our New England Congressmen are inclined to stomach weakness from lack of care in their diet, and also because of their excessive mental activity.

MR. MOSES H. GRINNELL, one of the veteran merchants of New York, died in December last at the age of seventy-five years. The house of which he was a member, Grinnell, Minturn & Co., was for many years one of the largest shipping firms in the country.

MRS. SARAH J. HALE, who still writes for *Godey's Lady's Book*, is in her eighty-ninth year. She attributes her physical and mental preservation to constant occupation, and she is right.

MR. ROEBLING, who with his father planned the details of the Brooklyn Bridge, one of the great engineering works of the age, and under whose direction the work goes on, has seen the structure but a few times in the last three years. When the great caisson was being sunk he contracted the "caisson disease" from exposure to the compressed air, and paralysis of the body and impairment of the nervous system have resulted.

GEN. M. C. BUTLER, of South Carolina, the new Senator, is a handsome man, of good figure, seeming a refined gentleman, with fine, gentle features, with a general aspect of extreme amiability.

MARRIED, in Detroit, on the 10th of October last, at the residence of the bride's father, by the Rev. C. F. Van Auken, Mr. Ira L. Guilford, graduate of the American Institute of Phrenology, now of Grand Ledge, Mich., to Cara Wightman, of Caro, same State. We learn that the newly-mated pair will prosecute phrenological work in company, Mrs. Guilford showing an earnest and practical interest in the subject.

MISS SALLY PARKER, of Proctorsville, an active young lady of eighty years, who has within a few years visited Great Britain and other European countries, and who visited the Centennial last summer, has gone to Washington for the winter, and expresses the determination to go to England again in a year or two.